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ORIGINAL ARTICLE

INTRAVENOUS IRON SUCROSE COMPLEX THERAPY IN IRON DEFICIENCY ANEMIA IN THE PREGNANT WOMEN

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ABSTRACT: OBJECTIVE: The aim of study was to improve the hematological parameters in pregnant women with iron deficiency anemia (IDA) with the use of iron sucrose complex & Clinical correlation of the parameters. **METHODS:** We used iron sucrose complex intravenously and assessed its effects on hematological parameters in pregnant anemic women. Hundred pregnant women with hemoglobin level of 8gm/dl or lower were given calculated dose of iron sucrose complex intravenously in several sessions. Allergic reactions were not noted. We have monitored Hemoglobin (Hb) levels and correlated it with clinical findings. **RESULTS**: Mean Hb level increased from 7.5 to 12 gm/dl, (P <0.5) and clinical parameters as breathlessness, tachycardia, tolerance to exercise were improved. **CONCLUSIONS**: Iron sucrose complex, when given to pregnant women with IDA, significantly improved the hematological parameters. Increased haemoglobin level improves the clinical parameters as breathlessness, tachycardia, tolerance to exercise etc.
KEYWORDS: Pregnancy, iron deficiency anemia, iron sucrose complex.

INTRODUCTION: Two thirds of the pregnant women in developing countries are affected by anemia.[1] Iron deficiency anemia is responsible for 95% of the anemia during pregnancy.[1-3] The factors responsible for producing IDA generally precedes the pregnancy, diet poor in iron content, menstrual losses, a rapid succession of pregnancies in which supplemental iron was not provided. Most women begin their pregnancy with partially or completely depleted iron reserves. So the severity of the anemia is inversely related to the amount of iron reserves.[3]

During pregnancy, there is a great demand for iron to meet the requirement of red blood cell mass expansion in the mother, fetal and placental blood and blood loss at delivery.[1,2] In pregnancy, iron deficiency is exaggerated because of the ability of fetus to extract its requirement in obligatory one way direction even from iron deficient mothers.[2] This is aggravated by poor absorption of iron due to adverse effects of pregnancy on the gastrointestinal tract, which include nausea and vomiting, motility disorder with reflux esophagitis and indigestion.[1,2]

In underdeveloped countries, anemia is a major contributory factor to maternal morbidity and mortality[4]. Inadequate antenatal care along with poor knowledge of dietary needs of pregnant woman, and overall poor socio-economic conditions are all responsible for this in our country.[5-7] Other countries of the Asian region like Indonesia[8] and Srilanka also report high prevalence of IDA in pregnancy and associated maternal and fetal loss. It is also associated with high perinatal mortality rate in our region.[6-9] A recent study reported a fetal mortality rate of 42 % at 7 month, 26 % at 8 months and 21 % at 9 months of gestation.

Over the past years, various oral, intramuscular and intravenous preparations of iron have been used for correction of IDA in the pregnant patients.[11-13] However, they are associated with significant side effects and it is not possible to achieve the target rise in Hb level in a limited time-

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period when patient is approaching the term. Iron sucrose complex (ISC) is a relatively new drug, which is used intravenously for the correction of IDA.[12, 13] The drug has been able to raise the Hb to satisfactory level when used in severely anemic iron deficient pregnant women.[14, 15] The aim of this study was to assess the efficacy and tolerability of ISC in pregnant patients with IDA seen at our institute and its clinical correlation.

MATERIALS AND METHODS:

Sample size: 100 pregnant women from 16 to 32 weeks of gestation**.**

Inclusion Criterion:

1. 16 –32 weeks of Gestation.
2. Hb level less than 8 gms per decilitre.

Exclusion Criterion:

1. Less than 16 weeks and above 32 weeks were excluded.
2. Thalassemia, hemolytic anemia, hypersplenism, infection, inflammation, liver or renal disease were excluded.

Hundred consecutive pregnant women between 16-32 weeks of gestation, diagnosed as cases of iron deficiency anemia, who were seen from January 2012 to December 2013 at the Sanjeevan Hospital included in the study. For the purpose of this study, iron deficiency anemia was defined as Hb level of <8 gm/dl.

The symptoms as palpitation, breathlessness, intolerance to normal activity were also marked and checked

All the patients received ISC in infusion form with the aim to correct the iron deficiency as well as to replenish the iron stores. The aim was to bring the Hb level to 12 gm/dl. Iron sucrose complex was administered as 100 mg elemental iron in 100 ml 0.9% normal saline infusion over 20 minutes every alternate day up to the total calculated dose. All the sessions were carried out in the day care setup

Formulae were used to calculate the iron requirement of the patient to fulfill the deficit as well as to replenish the iron stores and were calculated as follows:

- Amount of iron deficit (mg) = Body wt. (Kg) x Hb deficit x 0.3
  [Hb deficit = Hb target – Hb initial],
- Amount of iron to replenish (mg) = Body wt. (Kg) x 10.
- Total iron deficit (mg) = Amount of iron deficit + amount of iron to replenish stores.

Hemoglobin levels were done three weeks after completion of treatment.
Allergic reactions were not noted.

RESULTS: The total number of selected patients during the study period was 100. The age of subjects ranged from 21 to 35 years. The mean age was 30 years. Most of the patients were multigravida. The average gestational age was 30 weeks.

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Age group	No of patients
21 – 25	43
26—30	29
31--35	28

Table 1: Age distribution

The mean duration to achieve the target Hb level of 12 gm/dl was three weeks after completion of treatment. Before ISC infusion, the mean Hb level was 7.5 gm/dl After ISC infusion, the mean Hb level rose to 12 gm/dl.

No. of patients	Hb Before ISC Infusion	Hb After ISC Infusion
58	7.00 gms – 8.0 gms per dl	11.00 and above
23	8.00 gms – 9.0 gms per dl	11.00 and above
19	9.00 gms – 10.0 gms per dl	11.00 and above

Table 2: Hb before and after ISC

Before the treatment with ISC the patient were complaining the early fatigue, breathlessness, palpitation. These symptoms were preventing them from doing their routine household work. With the treatment patients were relived from breathlessness, palpitation. They have also noticed the increase in the energy for routine work.

DISCUSSION: The fetus and placenta require about 500 mg of iron and a similar amount is needed for red cell increment. An average postpartum blood loss and lactation for six months each accounts for about 180 mg. From total of 1360 mg, 350 mg may be subtracted (saved as a result of amenorrhea) to give an actual extra demand for about 1000 mg. This is unlikely to be provided by dietary iron but may be mobilized from full iron stores (about 1000 mg). It is the state of stores that largely determine whether or not a pregnant woman become anemic. The smaller her stores, the earlier the anemia occurs.[1, 2]

Our study showed that iron sucrose complex can be used in the pregnant patients with iron deficiency anemia not only for correction of deficit in the hemoglobin but also for restitution of iron stores. The mean duration of the period to achieve the target Hb in the present study was three weeks after completion of treatment as compared to 6.9 weeks in a previous study.[13]

We used Hb, levels to monitor response of hemopoietic system to iron sucrose complex because of their relative importance in the haemodynamic of the pregnant lady. Due to dilutional effect of pregnancy on plasma volume, there is a decrease in Hb, hematocrit and red blood cell count but MCV remains unaffected.[2]

Thus, serial evaluation is useful in differentiating dilutional anemia from progressive IDA during pregnancy. Except for bone marrow biopsy, serum ferritin is best indicator for assessment of iron stores in the non-pregnant women.[1, 2, 16] In pregnancy; it falls dramatically in second and third trimester, presumably because of hemodilution effect.[1]

Treatment of IDA has included oral iron, intramuscular iron, iron dextran; ISC, recombinant erythropoietin and blood transfusion.[2] However, most of these have their disadvantages. Even patients who respond well to oral iron therapy require a long time (months) to reach target Hb

compared with weeks required in case of treatment with ISC. The compliance is always a problem and to improve this, even iron-rich natural mineral water has been tried to treat IDA in pregnant women.[17] The use of intramuscular iron preparations in IDA is discouraged because of pain, irregular absorption and staining. Up to 30% of patients who were given iron dextran suffer from adverse effects, which include arthritis, fever, urticaria and anaphylaxis.[2]

In present study, none had side effects and anaphylaxis, thus showing the safety of the drug in the pregnant women. Side effects were not noted in the present study because the total dose of ISC was administered at intervals and it was given in diluted form and slowly.

CONCLUSION: This study showed significant improvement of Hb and iron stores in pregnant women given calculated dose of ISC infusion. It was safe and well tolerated. In our country with frequent IDA found in pregnancy, this type of treatment may be helpful in management of these patients.

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