

INTRAVENOUS IRON VERSUS ORAL IRON THERAPY IN POSTPARTUM ANAEMIA IN RURAL INDIAVijayalakshmi S¹, Mahendra G², Ravindra S. Pukale³, Rajkumari Linthoingambi⁵**HOW TO CITE THIS ARTICLE:**

Vijayalakshmi S, Mahendra G, Ravindra S. Pukale, Rajkumari Linthoingambi. "Intravenous Iron versus oral Iron Therapy in Postpartum Anaemia in Rural India". Journal of Evolution of Medical and Dental Sciences 2015; Vol. 4, Issue 10, February 02; Page: 1666-1671, DOI: 10.14260/jemds/2015/235

ABSTRACT: To compare effectiveness of intravenous iron–sucrose versus oral ferrous sulphate in postpartum anemia in rural area. **METHODS AND MATERIAL:** In this study, 120 women with postpartum anemia with hemoglobin (Hb) less than 10 g/dl within 48 h postpartum were randomised into two groups. Group I consisted of 60 women who received 300–600 mg of intravenous iron–sucrose every alternate day for 3 days. Group II consisted of 60 women who were given 300 mg ferrous sulphate orally daily for a month. Data collected after 1 month for Hb estimation and other postpartum parameters are assessed. **RESULTS:** The mean Hb was significantly increased in the intravenous iron sucrose group in 4th week of treatment but there was minimal change observed in mean Hb in patients treated with oral ferrous sulphate. Women treated with intravenous iron sucrose has shown significantly higher Hb as compared to those treated with oral iron. **CONCLUSIONS:** Overall intravenous iron sucrose appears to be an effective and safe mode of treatment in postpartum patients with no serious side effects than oral iron therapy.

KEYWORDS: postpartum anemia, iron sucrose.

INTRODUCTION: Anemia is the commonest cause of maternal mortality and morbidity in India due to iron deficiency.¹ Iron deficiency is more prevalent during pregnancy and one of the most important risk factor for the anemia. The prevalence of anemia in world population is estimated between 20% and 50%.²⁻⁴

- Major causes of higher prevalence of anemia in India, is malnutrition, due to lower socio-economic condition, hookworm infestation, malaria and poor availability of iron majorly in rural area.^{5,6} It is obvious that treatment of anemia efficiently would lead to considerable reduction in risk factors which affect pregnancy, fetal outcome and postpartum period.^{7,8} Postpartum hemoglobin (Hb) levels of <10 g/dl are observed in up to 30% of women, with more severe anemia (Hb < 8g/dl) seen in 10%.⁹ Partly attributable to an iron deficit during pregnancy caused by the increased iron demands of the fetoplacental unit and an increased maternal red cell mass.¹⁰ Irrespective of mode of delivery, blood loss is a contributing factor, with 5% of deliveries involving loss of more than 1 L.^{11,12} Iron deficiency anemia (IDA) is thought to contribute to a variety of morbidities such as lethargy, lactation failure and postpartum depression.^{13,14} The standard approach to treatment in the majority of UK institutions is oral iron supplementation, with blood transfusion reserved for more severe or symptomatic cases.
- However, it is unreliable in the treatment of severe anemia due to its limited absorption and gastrointestinal adverse effects that affect compliance by the patient.¹⁵

ORIGINAL ARTICLE

However, transfusion level varies widely between medical teams and institutions, with a significant proportion of transfusions given inappropriately. Parenteral iron administration with ferrous sucrose is now available and routinely used in a number of institutions. Good tolerance to this iron formulation due to the low allergenic effect and slow release of the elementary iron from the complex. The primary objective of the current study was to compare effectiveness of intravenous iron-sucrose versus oral ferrous sulphate in postpartum anemia.

AIMS AND OBJECTIVES: To compare effectiveness of intravenous iron-sucrose versus oral ferrous sulphate in postpartum anemia.

Analyze the effect of use of intravenous iron-sucrose complex in improvement of hemoglobin levels, patient satisfaction, quality of life, cost and hospital stay, impact on blood transfusion frequency, stress and postpartum depression.

MATERIAL AND METHODS:

A prospective comparative study.

Ethics committee approval was obtained.

Written informed consent from all women was obtained prior to participation in the study.

This study was conducted in Postnatal ward of AH & RC, AIMS, BG Nagara, Mandya district, Karnataka.

120 women aged 18 years or more with postpartum anemia with hemoglobin (Hb) less than 10 g/dl within 48 hrs postpartum were divided into two groups.

Group I consisted of 60 women who received 300–600 mg of intravenous iron-sucrose every alternate day for 3 days.

Group II consisted of 60 women who were given 300 mg ferrous sulphate orally daily for a month.

Data collected after 28 days for Hb estimation and other postpartum parameters are assessed. Placenta previa, abruption placentae, pre-eclampsia, clotting disorders, and peri-partum blood transfusion. Immuno-compromised patients, patients with severe cardiac, hepatic, renal with chronic uncontrolled systemic disease were also excluded. Patients not willing to come for follow up. The women were divided into two groups to receive intravenous or oral iron. Treatment was started at 24–48 h after delivery.

Group I: received 300–600 mg of intravenous iron in two or three divided doses given every alternate day for 3 days. Dose was calculated by means of the formula: Total iron dose in mg = $2.4 \times W \times \text{deficit} + 500$ (storage), where W is the body weight in kg, deficit = target Hb – actual Hb in g%. Total required dose of iron was administered as 100–200 mg iron-sucrose as a single dose repeated three times a week. Iron-sucrose was diluted in 100ml of 0.9 % sodium chloride and administered slowly within 30- 45 minutes in order to avoid any adverse reactions. They did not receive any further iron supplementation.

Group II: the women received 300 mg ferrous sulphate capsules, containing 100 mg elemental iron, once a day for 28 days. At the end of 28 days, a pill count was carried out.

ORIGINAL ARTICLE

Laboratory evaluation was done at the time of evaluation in the study, On day 0, all postnatal patients were subjected to complete clinical examination and we measured Hb. All patients were again subjected to the same investigations at 28th day of treatment.

From previous studies, it was found that treatment with intravenous iron-sucrose increases the Hb level by 25 % by day 5. With 90 % power at the 5 % significance level, we needed a sample size of 20 women in each group in order to detect the difference. All analyses were conducted by SPSS version 18.0. The groups were compared by the Student's t test.

Characteristics	Group I (Intravenous) N=58	Group II (oral iron) N=57	P value
Age	24+/-3.5	25+/_2.7	0.22
Weight	52+/-6.3	51+/-6.5	0.33
Pre-partum Hb	10.2+/-0.5	10.5+/-0.5	0.34
Postpartum Hb	8.7+/-0.9	8.8+/-0.6	0.28

Table 1: BASELINE CHARACTERISTICS OF WOMEN IN STUDY

RESULTS: Of the 120 patients, 115 completed the 4 weeks. Two women in group I and three in group II did not come for follow up on 28 days. 110 women had a normal vaginal delivery and the rest ten had LSCS. 83 were multigravida and 33 primigravida. All patients received 400µg of misoprostol rectally following delivery. The blood loss was between 500 to 1,000 ml for cesarean section and less than 500 ml in all cases of normal deliveries.

Calculated in OT and in labour room based on suction volume and swab weights.

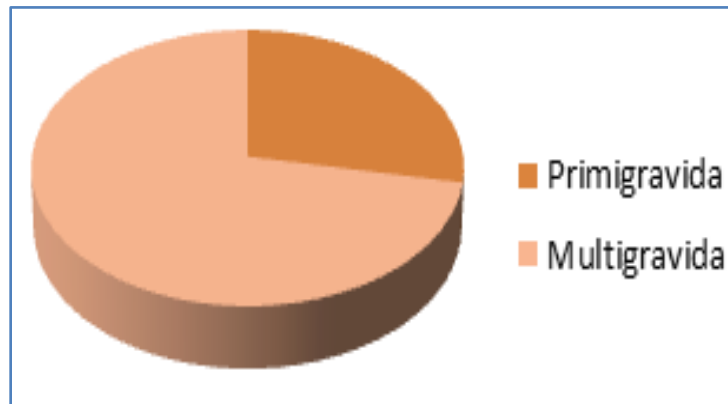


Fig. 1

ORIGINAL ARTICLE

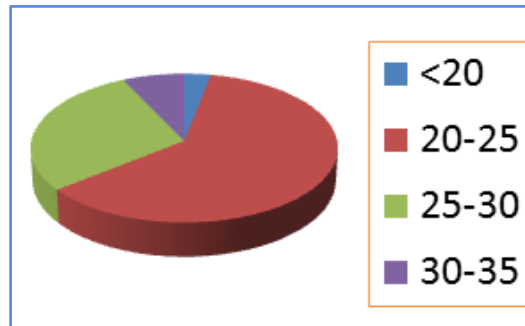


Fig. 2: AGE DISTRIBUTION

A significant improvement was observed with IV iron sucrose, the mean Hb was increased from 8.8gm/dl to 11.1gm/dl on day 28th ($p<0.005$).

On the other hand, in group II, there was no significant rise in mean Hb as shown in table below. Westad et al has reported significant improvement in hemoglobin after treatment with IV iron. The baseline hemoglobin 6.5gm/dl was raised to 11.9 after 4 weeks of treatment.

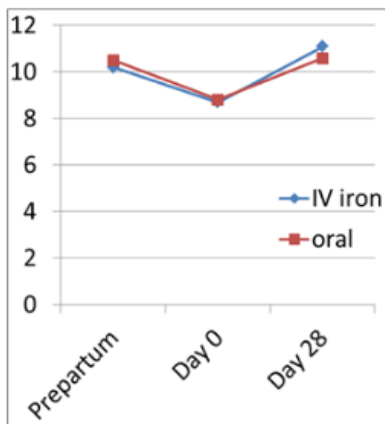


Fig. 3: HEMOGLOBIN RESPONSE

RESULTS AFTER TREATMENT WITH IRON:

Variable	Group I (intravenous) N= 58	Group II (oral iron) N=57	P value
Hb(gm/dl)			
Day 0	8.8+/-0.6	8.7+/-0.9	0.28
Day 28	11.1+/-0.8	10.6+/-0.9	0.004

Table 2

ORIGINAL ARTICLE

DISCUSSIONS: Iron deficiency anemia is one of the most common nutritional disorders in the developing world, including India. The study was done to ascertain whether administering intravenous iron–sucrose results in higher Hb concentration than oral iron in women with severe postpartum anemia. Our results indicate that 300–600 mg of intravenous iron on alternate days for 3 days significantly increases Hb levels with a mean increase of 2.3g/dl within 28 days respectively (1.9 gm/dl with oral iron).

Iron–sucrose appears to be effective because it is rapidly removed from the plasma and used for erythropoiesis. Supported by the study done by Broche et al. in which a mean increase in Hb of 1.9 g/dl within 7 days was obtained with intravenous iron and of 3.1 g/dl within 14 days without any serious side effects. In this study, intravenous iron–sucrose was well tolerated and no serious adverse effects were reported. The reason for high tolerance was partly due to lower allergenic effect of sucrose and very slow release of elementary iron from the complex. Intravenous iron–sucrose undoubtedly allows some blood transfusion to be avoided in postpartum women, even though the need for blood transfusion is unquestionable in life threatening situations.

CONCLUSIONS: The study was done to evaluate the efficacy of iron sucrose in postpartum patient in comparison with oral iron. Overall intravenous iron sucrose appears to be an effective and safe mode of treatment in postpartum patients with no serious side effects than oral iron therapy. These results suggest that intravenous iron–sucrose increases the Hb level more rapidly than oral ferrous sulphate in severe postpartum anemia without any serious adverse effects.

This treatment will help in avoiding some blood transfusions in young women.

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ORIGINAL ARTICLE

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