

Research Article**Parenteral Iron-Sucrose Transfusion in Pregnant Women with Severe Anaemia and its Outcome****Vandana S¹, Lakshmikantha G², Aravind Karinagannanavar³**¹Undergraduate student, Mysore Medical College & Research Institute, Mysore.²Assistant Professor, Department of Obstetrics and Gynaecology, Mysore Medical College & Research Institute, Mysore.³Assistant Professor, Department of Community Medicine, Mysore Medical College & Research Institute, Mysore.***Corresponding author**

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Abstract: Iron deficiency anaemia (IDA) is the most common nutritional deficiency anaemia in pregnant women. About half of the global maternal deaths due to anaemia occur in South Asian countries; India contributing to about 80% of this mortality ratio. Intravenous iron-sucrose appears to be a treatment of choice. To evaluate the effect of intravenous Iron-Sucrose complex in terms of improvement in haemoglobin status over 3 weeks following infusion in pregnant women diagnosed with IDA.2) To know any immediate side effects of the therapy on maternal condition and on foetal condition. A cross sectional study was conducted, where all the pregnant women within the inclusion criteria, attending the OPD of the Department of OBG, Cheluvamba Hospital, Mysore, were recruited. Study period was 1-06-2014 to 31-07-2014. The Hb status of pregnant women who were clinically diagnosed with anaemia was estimated by Sahli's acid- haematin method then Iron-Sucrose was given. Initially the mean Hb status of the subjects was 6.159 ± 0.7510 gm%. In the first week following iron sucrose transfusion, there was a rise in the mean Hb status to 7.015 ± 0.7576 gm%. The second week showed a further increase in the levels to 7.85 ± 0.695 gm%. In the third week the mean Hb status was found to be 8.625 ± 0.6606 gm%. The overall increase in haemoglobin level was found to be significant. Intravenous iron sucrose transfusion is an effective treatment strategy for pregnant patients with severe anaemia during late pregnancy and in patient's non compliant to oral therapy.

Keywords: pregnancy, severe anaemia, Intravenous iron sucrose

INTRODUCTION

Iron deficiency anaemia (IDA) is the most common nutritional deficiency anaemia in pregnant women with the prevalence being about 18% in the developed countries and 35-75% in developing countries[1]. About half of the global maternal deaths due to anaemia occur in South Asian countries; India contributing to about 80% of this mortality ratio[2]. Because of the persistently high burden of the disease, the WHO has long recommended the prenatal use of iron supplement in low and middle income countries. Iron deficiency early in pregnancy may have profound and long lasting effect on the brain development of the child[3]. Such women have a higher risk of preterm delivery in relation to non anaemic women[4]. Cardiac decompensation followed by death usually occurs when haemoglobin falls below 5g/dl [2].

Although oral iron therapy is widely used worldwide, its effectiveness is largely compromised by lack of absorption, poor compliance, increased adverse effects and discontinuation of treatment [5]. Intramuscular Iron-Dextran produced pain and discolouration of skin at the

injection site and is known to be associated with anaphylactic reactions[6]. Blood transfusion has its own hazards including anaphylactic reactions, deadly infections like HIV ,CMV, hepatitis and unavailability of blood especially of less common blood groups[7].

Intravenous iron-sucrose appears to be a treatment of choice with no serious side effects, indicated in the rapid correction of anaemia in pregnancy or restoring maternal iron stores, especially because the total stores can be administered over a short period of time[8]. Concerns about intravenous iron therapy potentially increasing the risks for infections and anaphylactic reactions have not been confirmed in prospective studies/clinical trials and remain largely unproven hypothesis[9].

Hence this study was conducted in the Department of Obstetrics and Gynaecology, MMC&RI, Mysore to evaluate the outcome of parenteral Iron-Sucrose infusion in pregnant women with severe anaemia.

Objectives

- To evaluate the effect of intravenous Iron-Sucrose complex in terms of improvement in Hb% status over 3 weeks following infusion in pregnant women diagnosed with IDA.
- To know any immediate side effects of the therapy on maternal condition and on foetal condition.

METHODOLOGY

Study design

This is a cross sectional study.

Study Area

Department of OBG, Cheluvamba Hospital, Mysore

Study subjects

All the pregnant women within the inclusion criteria, attending the OPD of the Department of OBG, Cheluvamba Hospital, Mysore.

Study period

June 1, 2014 - July 31, 2014.

Sampling technique

Non probability purposive sampling technique.

The inclusion criteria are:

1. Pregnant women within 30-36 weeks of gestation, with severe IDA (Hb 4-7 gm%).
2. Those less than 30 weeks of gestation showing poor compliance to oral therapy.
3. Those showing side effects to oral iron therapy.

The exclusion criteria are

1. Those who have received recent blood transfusion.
2. Known cases of complications of pregnancy like eclampsia, heart disease etc, where intensive monitoring is required or any other medical/ surgical complications.
3. Those with known allergy to parenteral Iron-Sucrose.

Procedure

The Hb status of pregnant women who are clinically diagnosed with anaemia was estimated by Sahli's acid- haematin method. 2 ml of EDTA chelated blood from severely anaemic patients was sent for peripheral smear examination to the Central Lab, KR Hospital, and Mysore. Microcytic, hypochromic appearance of RBCs confirm IDA. The Hb status of the patients confirmed with IDA was documented and they were subjected to the following treatment.

Treatment

Iron-Sucrose was given in a dose of 200mg in 100 ml Normal saline intravenously on 3 alternate days, one dose per day over a period of 30 minutes.

All three doses were given in the ward where equipment for cardio-pulmonary resuscitation and emergency drugs for anaphylactic reactions was available bedside. BP of these patients and heart rate of their foetuses were checked clinically, prior to and 15 mins and 30 mins after starting the infusion. Other outcomes like chills, rigor, tachycardia, crepitations and pre-term uterine contractions were monitored. Any minor/ major side-effects were documented. Hb estimation by Sahli's acid- haematin method was done weekly for a period of 3 weeks and the improvement in the general well-being of the patient was documented.

Ethical clearance for the study was taken from the Institutional Ethical Committee. Informed written consent was obtained from all the recruited patients before starting the therapy.

Statistical Analysis

Data was entered in Excel format and analysed using Epi- Info software. Statistical tests like frequency, mean and Repeated Measure ANOVA were applied.

RESULTS

The study was carried out at Cheluvamba hospital, Mysore Medical College & Research Institute, Mysore, Karnataka in order to find out the rate of increase of haemoglobin over three weeks and any side effects in pregnant women with severe anaemia, following iron sucrose transfusion therapy.

In our study majority were aged 19 years (Table-1).

Among the 25 pregnant women manifested with severe IDA, 21 (84%) of them were in 30-36 weeks of gestation and 4 (16%) of them were below 30 weeks of gestation at the time of diagnosis (Table-2)..

Initially the mean Hb status of the subjects were 6.159 ± 0.7510 gm%. In the first week following iron sucrose transfusion, there was a rise in the mean Hb status to 7.015 ± 0.7576 gm%. The second week showed a further increase in the levels to 7.85 ± 0.695 gm%. In the third week the mean Hb status was found to be 8.625 ± 0.6606 gm%. The overall increase in haemoglobin level was found to be significant (Table-3).

The first week showed a rise of 0.856 gm% (13.898%), the second and third week, 0.835 gm% (11.903%) and 0.775 gm% (9.873%) respectively in the mean Hb values. The total rise in the mean Hb status over three weeks following iron sucrose transfusion therapy was found to be 2.466 gm% (40.039%). All 25 women tolerated well for the therapy. All of them showed improved general look and better appetite as early as first week. No subjects were lost amounting to 100% compliance. No immediate major or minor side

effects were noted for both mothers and the foetus. The incidence of anaphylactic reactions were nil (Table-4).

Table-1: Age Distribution among Study Subjects

Age in Years	Frequency	Percentage
19	6	24%
20	4	16%
21	5	20%
22	4	16%
23	3	12%
24	2	8%
25	1	4%
Total	25	100%

Table-2: Gestational Age of Study Subjects

Gestational Age	Frequency (25)	Percentage
30-36 weeks	21	84%
Less than 30 weeks	4	16%
Total	25	100%

Table-3: Haemoglobin status after iron sucrose therapy

Time	Mean Hb%	SD
Hb % initial	6.159	0.7510
Hb % 1 st week	7.015	0.7576
Hb % 2 nd week	7.85	0.695
Hb % 3 rd week	8.625	0.6606

Mean square value; 44.90 F value:565.984 p value:0.00 (Repeated Measure ANOVA)

Table-4 : Rise in mean Hb levels

	Rise in mean Hb levels
Initial-1 st week	0.856 gm%
1 st week-2 nd week	0.835 gm%
2 nd week-3 rd week	0.775 gm%

DISCUSSION

In the present study we found that the total rise in the mean Hb status over three weeks following iron sucrose transfusion therapy was found to be 2.466 gm% (40.039%) which was comparable with the following studies (Table-5).

In our study, there is an overall haemoglobin rise of 2.46 gm% over 3 weeks period after administration of a total of 600mg iron sucrose only in the first week, which is statistically significant. After comparing with other studies one can conclude that there is 0.8 - 1.0 gm% increase every week after administration of iron sucrose and this rise can improve the appetite and general well being of the patient which will break the vicious cycle of ill health and anemia.

The improved compliance is mainly because of less frequent visits and lesser side effects. Although our study does not report any adverse effects, other large

studies quote 8 % minor side effects like chills, rashes and thrombophlebitis. The only contraindication to the use of iron sucrose is prior hypersensitivity to iron sucrose and anaemia not associated with iron deficiency. However as there is a report on fatal adverse reaction after iron sucrose administration clinicians should be alert with all the resuscitative measures and a test dose before the infusion. The limitation of our study was small number of cases and we could not use higher investigating tools for assessing the response.

Table-5 : Comparison of Hb rise with other studies.

Study	Year	Duration of treatment	Hb rise (gm%)
Abhilashini et al [10]	2011	after 2 weeks	1.26
		after 4 weeks	2.59
Deepthi shrivatsava et al [11]	2012	after 1 week	1.1
		after 2 weeks	2.3
		after 3 weeks	3.0
Present study	2014	after 1 week	0.85
		after 2 weeks	1.68
		after 3 weeks	2.46

CONCLUSION

Intravenous iron sucrose transfusion is an effective treatment strategy for pregnant patients with severe anaemia during late pregnancy and in patients non compliant to oral therapy. However large randomised controlled studies are required to strongly recommend the conclusion.

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