



Original Article

Rationale of Parenteral Iron Sucrose Therapy in Gynecology Patients Awaiting Surgery: A Prospective Study from Central India

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Abstract

Background: Iron deficiency anemia (IDA) is more prevalent in South Asian countries which accounts for more than half of the maternal death. India is the leader in maternal death due to IDA.

Aims and Objectives: To study improvement in hematological parameters after parenteral Iron sucrose therapy in women undergoing major gynecological surgery.

Materials and Methods: Thirty patients with iron deficiency anemia who were admitted for major gynecological surgery having hemoglobin <10 gm% were studied. Study cohort received 300 to 600 mg of iron sucrose by intravenous route. Hematocrit, mean corpuscular volume and haemoglobin were recorded before and after therapy at the end of one week. All the data were analyzed using IBM SPSS- ver.20 software. P values <0.05 was considered to be significant.

Results: Most of the patients had age >40 years (66.7%), parity >2 (60%), education till 12th or below (100%) and had monthly income of 2000 or less (60%). Out of 30 patients, 53.3% received iron sucrose whereas 46.75% received iron sucrose with blood transfusion. In 26.7% patients hemoglobin was raised by 0.5 to 1 gm%, in 80% subjects MCV changed up to 10 fL and in 73% of the subjects haematocrit value changed by 5% or more.

Conclusion: Treatment with parenteral iron sucrose with or without blood transfusion is effective in improving hemoglobin concentration in subjects with major gynecological surgery.

Keywords: Iron sucrose, blood transfusion, gynecological surgery, intravenous iron sucrose.

Introduction

Prevalence of Iron deficiency anemia (IDA) in gynaecological outdoor is high.¹ Patients waiting for surgery need to have a specific, potent

hematinic therapy to improve hematological status in short period.¹

As per the World Health Organization (WHO) prevalence of IDA is high in developing countries

(average 56%) compared to developed countries (18%).² According to WHO, South Asian countries accounts for more than half of the global maternal deaths, out of that contribution of India is highest.³

Patients having hemoglobin (Hb) level <11 gm% is considered to be anemic as suggested by WHO.¹ ICMR classify IDA as mild (8-11 gm%), moderate (5-8 gm%) and severe anemia (<5 gm%).⁴

Oral iron therapy is the first choice for treatment and prophylaxis in patients with mild IDA in gynecological surgery. But for moderate to severe form of anemia oral iron therapy takes longer time to achieve target. Also in India, compliance with oral iron is another big issue. Hence parenteral iron therapy with or without blood transfusion is a better option for the treatment of moderate and severe anemia.

In parenteral iron therapy several option are available including iron dextran, iron sorbitol citrate and iron sucrose. Iron sucrose has been reported to be safe and effective in women undergoing gynecological surgery.⁵ The injection can be given without test dose.⁶

Hence present study was performed to study improvement in hematological parameters specially Hb after parenteral Iron sucrose therapy in women undergoing gynecological surgery.

Materials and Methods

A prospective observational study was performed in a tertiary hospital involving 30 subjects who

were admitted for gynecological major surgery having hemoglobin (Hb)<10 gm%.

Pre-tested questionnaire containing demographic data, diagnosis, preliminary investigations showing complete blood count (CBC), urine analysis, blood grouping and ultrasonography examination was filled and data was recorded in excel sheet.

All gynecological cases requiring major surgery having anemia (Hb<10gm %) and patients with no urgency for surgery were included whereas patients with malignancy, diabetes, respiratory or cardiac disease, sensitivity to drug and having other medical complications except anemia and hypertension were excluded.

All patients received 300mg to 600mg of Iron sucrose intravenous in 500 ml normal saline in divided dose. Hematocrit, mean corpuscular volume and haemoglobin percentage were studied before and after therapy at the end of one week.

All the data were analyzed using IBM SPSS-ver.20 software. Frequency distribution and cross tabulation was used to generate tables. Analysis was performed using chi-square test and independent sample student t test. P values <0.05 was considered to be significant.

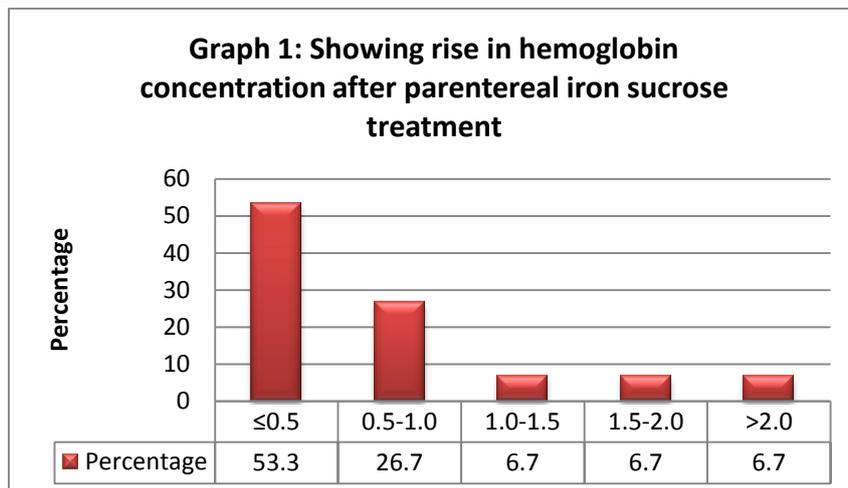
Results

Out of 30 subjects, 16 (53.3%) received only iron sucrose whereas 14 (46.75%) received iron sucrose with blood transfusion.

Table 1: Showing different Characteristics of study cohorts

Characteristic		No of patients	Percentage
Age (years)	≤40	10	33.3
	>40	20	66.7
Parity	≤2	12	40
	>2	18	60
Education	≤ class 12th	30	100
	> class 12th	0	0
SES (income/month)	≤2000	18	60
	>2000	12	40

Data is expressed as no of patients (percentage), SES; socio economic status



There was change in MCV value by 10 fL or more in 6 (20%) cases and in 24 (80%) cases it was less than 10 fL. Change in Haematocrit value by 5% or more was recorded in 22 (73%) cases.

Discussion

Hysterectomy is the one of the common gynecological surgery performed in women. Most common indication of such surgery is fibroid, adenomyosis, dysfunctional uterine bleeding etc.^{7,}

⁸ Women undergoing such surgeries suffer from anemia due to excessive and/or irregular menstrual bleeding. In these women, serum ferritin levels are inversely proportional to the duration and intensity of menstrual bleeding indicating iron deficiency anemia.⁹

Oral route is the preferred route for the treatment of mild anemia. Oral iron supplementation often leads to adverse effects including nausea, vomiting, constipation and abdominal pain.¹⁰ However oral iron therapy require many months to reach target Hb.¹¹ Intravenous iron therapies is effective alternative to oral therapy and immediate increase in Hb level with rapid restoration of iron stores in a limited time-period when patient is approaching the term and reduce blood transfusion with associated risks near term.^{11,12}

In present study we found improvement in Hb, MCV and haematocrit value after one week of intravenous iron sucrose treatment. Kriplani et al studied 100 pregnant women with Hb level between 5-9 gm% with diagnosed iron deficiency, women were given intravenous iron sucrose complex in a dose of 200 mg twice weekly. Author reported that mean Hb level raised by 3.57 gm%, serum ferritin levels was raised by 57.8 µg/l

and reticulocyte count by 3.1% after two weeks of treatment.¹³ Similar findings were revealed in present study. In another study by Swami et al who studied 264 pregnant women with anemia reported initial rise in Hb within a week and rise of 1-2gm Hb per week attaining a targeted Hb.¹⁴ Similar to present study reports, a retrospective study from Delhi on 445 pregnant women revealed a rise in Hb from 7.3 ± 0.67 g/dl to 10.80 ± 0.58 g/dl after completion of total iron infusion therapy ($p < 0.001$).¹⁵

A study from San Juan by Morales-Borges who studied the records of 3,643 deliveries for intravenous iron therapy (125 mg daily) reported that majority of the patients were at the third trimester (76%). The treatment significantly improved the Hb and was well tolerated.¹⁶ A German study in 2005 suggest a better short- and long-term efficacy as well as gastrointestinal tolerability for iron sucrose over iron sulfate in the management of IDA in IBD.¹⁷

The possible reason why iron sucrose is more efficient in treating anemia compared to iron dextrans or iron gluconate is probability explained by Perewusnyk et al, who found low accumulation of iron sucrose in parenchyma of organs whereas incorporation of iron sucrose into bone marrow is faster which increase erythropoiesis.^{18,19} Our results are very similar to the results obtained by T. Mays with an average Hb response of 1.9 gm/dl.²⁰ Study conducted by Bhandal et al also

documented rapid increase in Hb level of postpartum anemic women by intravenous iron sucrose therapy. It also replenishes iron stores more rapidly.²¹ A swiss study by G. Perewusnyk documented efficient and safe results of iron sucrose in pregnancy anemia, also reducing rate of blood transfusions.¹⁸ A Karachi Study conducted in 2002, by Wali and Mushtaq documented that intravenous iron therapy is safe, convenient and more effective than intramuscular iron therapy in treatment of iron deficiency anemia during pregnancy and the intravenous iron therapy can replace blood transfusion in antenatal period.²² Present study has few limitation of being less in sample size and single centre; a large randomized clinical trial comparing all the possible iron treatment is required to strengthen the present study findings.

Conclusion

Parenteral iron sucrose in dose 300 to 600mg only or in combination with blood transfusion showed quite impressive results in improving hemoglobin in subjects who were waiting for surgery and not having any pressure for emergency management. Treatment was found safe and effective in maintaining iron stores, improving the haematological parameters and was not associated with serious allergic reactions.

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