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Intravenous Iron Sucrose Therapy in Anemia with Pregnancy

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Abstract
Anemia of pregnancy is most common medical disorder in the developing country, affecting 2 billion population worldwide. In India prevalence is 49.7% of pregnancy contributing to 80% of maternal mortality. Parental iron therapy produces rapid, complete correction of iron deficiency including iron stores. Intravenous iron sucrose therapy has become gold standard in management. It has many advantages over other iron preparations in correction of anemia.**AIMS AND OBJECTIVE:** Evaluation of hemoglobin improvement, time required, and patient's compliance after iron sucrose therapy.**MATERIAL AND METHODS:** Retrospective analysis was done of 264 pregnant women with anemia who were admitted in AL-Zahra Teaching Hospital from May 2015 to August 2019, and were diagnosed as iron deficiency anemia and had received intravenous iron sucrose 200 mg weekly till targeted hemoglobin 10gm was reached.**RESULTS:** majority of women (54.2%) were in age group of 21-29 years. 66.3% were resident of rural area. Anemia was more common (69.7%) in women with vegetarian diet. 83% 0f patients were multigravida. 48.9% cases were of mild, 44.7% of moderate, and 6.4% of severe anemia. There was initial rise in Hb within a week and rise of 1-2gm Hb per week attaining a targeted Hb. CONCLUSION: Iron sucrose is the best tolerated drug, gives mean Hb rise by 600 mg in all grades of anemia and in maximum periods of 4 weeks. Looking at the patient's compliance and feasibility this drug has replaced strategy of unnecessary blood transfusions.
Keywords: Anemia of pregnancy, Pareneteral therapy, Iron sucrose therapy.
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INTRODUCTION

Anemia in pregnancy affects 2 billion population in the world. Most common in Asia and Africa. 1 In India more than 50% pregnant women suffer from anemia contributing to most common cause of maternal mortality and morbidity. 76% of all anemia were found to be microcytic and hypochromic. 2,3 Iron deficiency anemia is due to low iron stores in body. It begins in childhood, worsens during adolescence and gets aggravated during pregnancy. Data from the NNMB4 showedthat iron and folic acid intake was very low in all age group in the country. Poor iron stores at birth4 low iron content in breast milk, low dietary intake of iron in infancy and childhood, gets worsened in adolescent. Multi parity, abortions, Menorrhagia, malaria and hookworm, tuberculosis, urinary tract infection, malabsorption, food cooking habits, high phytate diet5 all contribute to iron deficiency in India. 6,7 Pregnant women enrolled at 20-26 weeks of pregnancy showed that, 75% had mild anemia, 14.8% had moderate and 0.7% had severe anemia (Hemoglobin (Hb) below 7gm/dl.). Major effect of anemia in pregnancy is maternal and neonatal mortality and morbidity8,9 Anemia causes preterm birth, pregnancy induced hypertension, eclampsia, placental abruption, hypotonic uterine contraction, atonic postpartum hemorrhage, puerperal sepsis. fetal risk includes, intrauterine growth retardation, prematurity, poor apgar score, fetal distress, neonatal anemia. Infants have failure to thrive, poorer intellectual developmental milestones10. This highlights the importance of diagnosis and treatment of anemia at all age group with special emphasis in pregnancy. Skilled management of severe grades of anemia detected in late pregnancy, by blood transfusions and parental iron therapy became the hallmark of good obstetric practice resulted in maternal and prenatal salvage. 11 Government of India included routine iron and folic acid supplement to children, pregnant and postpartum mothers in maternal and child health program. But due to poor compliance at all level anemia could not be prevented by oral iron therapy indicates the level of ignorance and indifference to health needs. There is an urgent need to educate pregnant women and their families about the importance of antenatal care and optimum family size. Oral iron therapy though is first line treatment but has its own limitations. In women with chronic blood loss, gastrointestinal diseases, poor compliance, oral iron fails to meet the iron demand. These women are benefited by parental iron therapy. 12 This therapy produces rapid and complete correction of iron deficiency producing more rapid erythropiotic response than oral iron therapy. 13 Therefore intravenous iron has become a Holy Grail in the management of iron deficiency anemia (IDA) in pregnancy in our country. Iron sucrose has got more safety, rapid response, as compared to iron dextran, iron sorbital and iron gluconate as well as blood transfusion. 12,14 Unlike other iron preparations, iron sucrose can be given without any test dose with no reported serious adverse reaction. Hence iron sucrose appears to be a treatment of choice for safe and rapid correction of anemia. AIMS AND OBJECTIVE: 1. Evaluation of Hemoglobin improvement after iron sucrose administration. 2. Estimate time required for Hemoglobin improvement. 3. To test patient compliance and feasibility with intravenous iron sucrose.

MATERIAL AND METHODS

Retrospective study of 264 pregnant women diagnosed as iron deficiency anemia, admitted in Al-zahra Teaching Hospital for treatment, from May 2015 to August 2019 was undertaken. They were treated with iron sucrose therapy, 200 mg per week till targeted hemoglobin of 10gm/ dl was reached. Weekly estimate of Hemoglobin (Hb) improvement test was done before each dose of iron sucrose. 200 mg iron sucrose was dissolved in 200 ml normal saline and transfused in 30 minutes. Patients were observed for any transfusion reaction. Results variables include demographic variables, age, parity, diet, gestational age, hemoglobin concentration in inferential statistics. We applied Chi-square test, student paried T test. All statistical analysis were done with the help of SPSS version 20.0 software. Results were tabulated as under.

RESULTS

Total 264 pregnant women were enrolled in the study

1: Age Distribution of the Patients age 21-29years.no.of cases 143 percentage 54.2 .age 30-39years.no.of cases 94.percentage 35.6 age>40 no.of cases 27 percentage 10.2.

2.Geographical Distribution of Patients Rural no.of cases 175 percentage 66.3 Urban no. of cases 89 percentage 33.7

3: Dietary Pattern of the Patients Veg no.of cases184 percentage 69.7 Non veg no.of cases 80 percentage 30.3

4: Parity wise Distribution of Anemia Primigravida no.of cases 45 percentage 17 Multigravida no. of cases 219 percentage 83

5: Distribution of Anemic Cases According to Gestational Age 24-28 weeks no. of cases 118 percentage 44.7 - 8-32 weeks no.of cases 82 percentage 31.1 - >32 weeks no. of cases 64 percentage 24.2

6: Distribution of Cases according to Initial Hemoglobin Leval (Mild, moderate, severe) .sever less than 7gm no. of cases 17 percentage 6.4 . moderate 7-8 gm no. of cases 118 percentage 44.7 mild 8-9.9 no. of cases 129 percentage 48.9

7: Dose of Iron Sucrose Required In Anemic Women . Dose 200mg no. of cases 53 percentage 20.1 .Dose 400mg no.of cases 26 percentage 9.8 .Dose 600mg no.of cases 154 percentage 58.3. Dose 800mg no.of cases 31 percentage 11.7

8: Weekly Rise in Mean Haemoglobin after Each 200mg of Iron Sucrose Given in Various Grades of Anemia .Severe anemia no. of cases 17 .Baseline hemoglobin 5.31gm/dl 1 week Hb (200mg)6.69gm?dl 2week Hb (200mg) 7.54gm/dl 3 week (200mg)) 8.66gm/dl 10.84gm/dl 4week(200) 800mg Moderate anemia no. of cases 118 Baseline hemoglobin 7.26gm/dl 1 week Hb (200mg) 8.57gm /dl 2week Hb (200mg) 9.27gm/dl 3 week (200mg) 10.8gm/dl 4week(200) _ Mild anemia no. of cases 14 Baseline hemoglobin 8.35gm /dl 1 week Hb (200mg) 8.29gm/dl 2week Hb (200mg) 8.82gm/dl 3 week (200mg) 9.50gm/dl 4week(200) 10.78gm/dl no. of cases 37 Baseline hemoglobin 8.89gm/dl 1 week Hb (200mg) 9.39gm/dl 2week Hb (200mg) 9.69gm/dl 3 week (200mg) 10.73gm/dl _ no. of cases 24 Baseline hemoglobin 8.75gm/dl 1 week Hb (200mg) 9.74gm/dl 2week Hb (200mg) 10.75gm/dl _ _ no. of cases 53 Baseline hemoglobin 9.30gm/dl 1 week Hb (200mg) 10.63gm/dl _ _ _

DISCUSSION

In the present study majority of cases belongs to the age group of 21-29 years, having a mean age of 25.67±3.7 years which is comparable with study of Prasanna B et al in 2014, Sunita Dubay, Vanita Suri et al, in 2013 observed mean age of 24.23±3.8 years and 25.53±2.93 years respectively. Agrawal et al in 2012 observed mean age of anemia as 28.1±5.36. This indicate that age is not the predominant factor which can determine prevalence of anemia of pregnancy. In the present study majority of women (66.3%) belonged to rural area. Divakar et al, in 2012 and Judhith A Naronha in 2008 had observed same result 69.4% and 70% respectively, 15 it means rural women are more likely to be affected by anemia of pregnancy. In the present study 69.7% of the women were vegetarian by diet. Judhith A Naronha15 and Sharma JB, Soni D et al, 16 observed that 50.74%, and 96.18 women were found vegetarian by diet in their study, this highlights that anemia is more common in women consuming vegetarian only diet. In the present study 83% anemic women were multigravida, which is slightly higher compared with the study conducted by Agrawal Rohina et al, 17 in 2010, Judhith A Naronh et al in 2008 and Awasthi et al, 18 in 2001. They found that 60%, 61.4%, and 65.5% pregnant anemic women were multigravidas respectively. This proves that anemia is more common in multigravida due to maternal depletion of iron stores caused by repeated pregnancy. 17% primigravida women were anemic in present study, It may be due to low iron stores in childhood and adolescent age. In the present study all women had anemia after 24 weeks of pregnancy, 24-28 weeks (44.7%), 28-32 weeks (31.1%) and >32 weeks (24.2%). This denotes that the late second trimester Is very vulnerable for anemia of pregnancy. This result is comparable with study of Prasanna B et al, 19 Sunita Dubey, 20 Alka Kriplani et al, 21 Agrawal R, 17 who detected maximum incidence in 26.3±4.07 weeks, 29.68 weeks, 25.69 weeks, 28.2±2.30 weeks and 28.2 weeks respectively. Advancing gestational age significantly increases the risk of anemia due to physiological increase of plasma volume and

more requirement of iron for building up of hemoglobin mass at this gestational period.Signaling meticulous planning for the treatment and prevention of iron deficiency anemia. In the present study 48.9% women were having mild, 44.7% moderate and 6.4% severe anemia. Our study is comparable to the study conducted by Judhith A Noronha et al in 2008 who found 63.5% were mildly anemic 35% moderately anemic, 1.5% severely anemic. Alka Kriplani et al in 2013 found that, 68% were moderately anemic and 32% mildly anemic. This indicates that mild and moderate anemia is more common as compared to severe anemia during pregnancy In the present study the minimum iron sucrose required to achieve the target hemoglobin of 10gm/dl was 200mg and maximum iron sucrose was 800mg. In other studies conducted by Bhupesh Dewan et al, 22 in 2012, Christopher et al, 23 in 2011, Christian Breyman et al, 24 in 2006 maximum dose required was 1050mg, 1200mg and 1600 mg and the minimum dose required was 100mg, 300mg, 400mg respectively.During pregnancy approximately 700-1400mg total iron is required. The fetal iron requirement during pregnancy is 20 mg at 20 weeks, 200mg at 32 weeks, 300mg at 36 weeks. Hence there becomes a negative iron balance during pregnancy and dietic iron is not enough to meet the daily requirement especially in the second half of the pregnancy.

CONCLUSION

On the basis of results we conclude that: 1. Iron deficiency anemia is more common in the age group of 21-29 years, in rural population, consuming vegetarian diet only and in multigravida, after 24 weeks of pregnancy. 2. Mild and moderate anemia is more common than severe anemia. The best target achievement of 4gm was attained in 4 weeks and as most of the women reported in late second trimester, they had the ideal benefit of gaining hemoglobin before the delivery. 3. Iron sucrose is the best tolerated drug giving mean hemoglobin rise by 600 mg iron in all grades of anemia and in maximum period of 4 weeks. Hence looking at patient compliance and feasibility this drug has replaced the strategy of unnecessary blood transfusions.

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