

Comparative Assessment of Administration Iron By Different Routes Among Deficient Antenatal Women: A Hospital Based Study

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ABSTRACT

Background: Iron deficiency anemia and its cost continue to be prevalent in epidemic incidences inspite major health alterations over the past century. In India, prevalence varies between 33-89%. The present study was conducted to compare the Assessment of Administration Iron by Different Routes among Deficient Antenatal Women.

Materials and Methods: The study included 200 pregnant females between the age of 18 to 40 years. Only singleton pregnancies were included in the study. Patients with multifetal pregnancy, Hb level <80 or >110 g/L, preexisting illness, history of miscarriage or stillbirth, allergy to intramuscular administration of iron were excluded from the study. The females in the oral iron group were provided 100 mg ferrous sulfate and 500 µg Folic acid as daily dose. The females in the parenteral group were given 3 im injections of 250 mg elemental Fe as iron dextran in a volume of 5 mL at 1-month intervals.

Results: There were only 15% females in Group 1 and 10% females in Group 2 with Hb level <90 g/L at the end of

treatment. There were 16 females in group 1 and 28 females in group 2 with Hb levels ≥ 110 g/L at the end of study.

Conclusion: In our study, significant improvement in the iron level was observed in both the scenarios, oral and intramuscular administration of iron.

Keyword: Anaemia, Administration, Intramuscular, Iron.


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INTRODUCTION

Iron deficiency anemia and its cost continue to be prevalent in epidemic incidences inspite major health alterations over the past century.¹ Center of Disease Control has defined anemia as pregnancy haemoglobin less than 11 g/dl (Hematocrit:33%) in the first and third trimester and less than 10.5 g/dl (Hct:32%) in the second trimester whereas the World Health Organisation has defined anemia in pregnancy as Hb less than 11gm/ dl.^{2,3} Iron deficiency anaemia is the most frequent nutritional deficiency amongst pregnant females. According to WHO, its prevalence is about 18 per cent amongst the developed countries and 35-75% amongst the developing countries.⁴

Worldwide, the prevalence of anaemia is 55.9% with variations observed between developed and developing nations. In India, prevalence varies between 33-89%.⁵ The prevalence of occult iron deficiency in the absence of anemia is found to be varying between 30 and 60% amongst pregnant females.⁶

In a population-based survey from the rural areas of Haryana in the year 1994-1995, it was found that prevalence of anemia among non-pregnant women in the age group of 16-70 years was 50%.⁷ According to the Global Nutrition Report 2016, India ranked

miserably at the 170th in prevalence of anemia amongst females.⁸ The present study was conducted to compare the Assessment of Administration Iron By Different Routes Among Deficient Antenatal Women.

MATERIALS AND METHODS

The present study was conducted in the department of Pathology, SMS Medical College, Jaipur, Rajasthan, India. The study was approved by the institutional ethical board and all the subjects were informed about the study. A written consent was obtained from them in their vernacular language. The study included 200 pregnant females between the age of 18 to 40 years. Only singleton pregnancies were included in the study. Patients with multifetal pregnancy, Hb level <80 or >110 g/L, preexisting illness, history of miscarriage or stillbirth, allergy to intramuscular administration of iron were excluded from the study. The females in the oral iron group were provided 100 mg ferrous sulfate and 500 µg Folic acid as daily dose. The females were inquired about their stool colour to ensure that they had taken the tablets. The females in the parenteral group were given 3 im injections of 250

mg elemental Fe as iron dextran in a volume of 5 mL at 1-month intervals. Precautions were taken to prevent the occurrence of anaphylactic reaction by initially providing a test dose. The injection was provided in the gluteal region by using the Z-technique. All the females in the parenteral iron group were also given an oral dosage of 5 mg folic acid twice a week. An

elaborated history was obtained from all the females, and a complete physical evaluation and an obstetric evaluation was performed at the time of recruitment. A routine follow up was performed until delivery. All the data thus obtained was recorded in a tabulated form and analysed using SPSS software. Probability value of less than 0.05 was regarded as significant.

Table 1: Female characteristics in the 2 groups

Characteristics	Group 1 (Oral Route)	Group 2 (Parenteral route)
Age (yrs)	24.8±4.1	25.6±2.2
Parity (%)		
1	37	40
≥2	63	60

Table 2: Hemoglobin distribution in the 2 groups before and after treatment

Hemoglobin	Group 1 (Oral Route)		Group 2 (Parenteral route)	
	before treatment	after treatment	before treatment	after treatment
	(%)	(%)	(%)	(%)
<90 g/L	25	15	35	10
90–99 g/L	41	28	21	12
100–109 g/L	34	41	44	50
≥110 g/L	0	16	0	28

RESULTS

The study consisted of 200 females, 100 were given oral iron supplementation and rest 100 were provided parenteral iron supplementation. The mean age of Group 1 females was 24.8±4.1 years while that of Group 2 females was 25.6±2.2 years. In group 1, 63 women had parity more than or equal to 2 and in group 2, 60 women had parity more than or equal to 2. (Table 1) Table 2 denotes the Hemoglobin distribution in the 2 groups before and after treatment. There was a significant improvement in the haemoglobin levels amongst both the groups. There were only 15% females in Group 1 and 10% females in Group 2 with Hb level <90 g/L at the end of treatment. There were 16 females in group 1 and 28 females in group 2 with Hb levels ≥110 g/L at the end of study.

DISCUSSION

Efficient communication to all pregnant females about diet counselling and nutrition is a crucial part of anaemia prevention during pregnancy. However, as the extra demand of iron is often not met by the routine diet, regular supplementation with iron is advised by most of the experts during pregnancy. Amount for supplementation of iron varies from region to region, the CDC advises that all pregnant females to begin with a 30 mg per day iron at the first prenatal visit⁹. WHO suggests that 30–60 mg per day of elemental iron for all the pregnant females whereas the British guidelines do not advise any iron supplementation during pregnancy^{10,11}. In areas with prevalence of anemia amongst pregnant females of less than 20% WHO specifies, intermittent oral iron and folic acid supplementation with 120 mg of iron and 2.8 mg of folic acid once a week for pregnant females to improve maternal and neonatal health^{10,11}. Intravenous iron combines the reward of complete bioavailability with lesser gastrointestinal

adverse effects and faster recovery of Hemoglobin than oral iron. However, the elevated risk of oxidant damage, more cost and smaller but risk of hypersensitivity limits the prolonged use of intravenous iron.¹² In present study, 200 females, 100 were given oral iron supplementation and rest 100 were provided parenteral iron supplementation. The mean age of Group 1 females was 24.8±4.1 years while that of Group 2 females was 25.6±2.2 years. In group 1, 63 women had parity more than or equal to 2 and in group 2, 60 women had parity more than or equal to 2. There was a significant improvement in the haemoglobin levels amongst both the groups. There were only 15% females in Group 1 and 10% females in Group 2 with Hb level <90 g/L at the end of treatment. There were 16 females in group 1 and 28 females in group 2 with Hb levels ≥110 g/L at the end of study. A study by Kriplani A et al shows a significant rise in ferritin and haemoglobin levels after of iron to pregnant females.¹³ A study comparing the clinical efficacy and safety of intravenous iron sucrose with intramuscular iron sorbitol citrate, found rise of hemoglobin was more in iv group. This study proved the superiority of intravenous iron administration to im therapy in terms of rise of Hb and also safety profile.¹⁴ Sood et al found a more increase in hemoglobin level with im administration of iron than with oral or intravenous dose. They observed 2 cases of severe allergic outcomes with intramuscular administration of iron.¹⁵

CONCLUSION

Since there is high prevalence of iron deficiency anaemia amongst the pregnant females, diet and nutrition counselling needs to be performed during the clinical setting. In our study, significant improvement in the iron level was observed in both the scenarios, oral and intramuscular administration of iron.

REFERENCES

1. Stevens GA, Finucane MM, De-Regil LM et al. Global, regional, and national trends in haemoglobin concentration and prevalence of total and severe anaemia in children and pregnant and non-pregnant women for 1995-2011: a systematic analysis of population-representative data. *Lancet Glob Health* 2013; 1(1):e16–e25.
2. CDC (1989) CDC criteria for anemia in children and childbearing- aged women. *MMWR Morbidity and mortality weekly report*. 138(22):400–4.
3. WHO (2001) Iron deficiency anemia: assessment, prevention and control. WHO/NHD/01.3, Geneva. World Health Organization, Switzerland
4. Dutta Dc. Textbook of obstetrics including perinatology & contraception. 6th ed. Calcutta: New Central Book Agency (P) Ltd; 2004. Anaemia in pregnancy; pp. 262–7.
5. Ezzati M, Lopez AD, Dogers A, Vander HS, Murray C. Selected major risk factors and global and regional burden of disease. *Lancet*. 2002;360:1347–60.
6. Daru J, Cooper NA, Khan KS. Systematic review of randomized trials of the effect of iron supplementation on iron stores and oxygen carrying capacity in pregnancy. *Acta Obstet Gynecol Scand* 2016; 95(3):270–9.
7. Malhotra P, Kumari S, Kumar R et al. Prevalence of anemia in adult rural population of North India. *J Assoc Phys India* 2004;52:18–20.
8. Haddad L, Hawkes C, Udomkesmalee E et al. (2016) Global Nutrition Report 2016: From Promise to Impact: Ending Malnutrition by 2030. International Food Policy Research Institute, Washington.
9. Centers for Disease Control and Prevention (1998) Recommendations to prevent and control iron deficiency in the United States. *MMWR Recomm Rep Morb Mortal Week Rep Recomm Rep* 47(Rr-3):1–29.
10. World Health Organization (2016) WHO recommendations on antenatal care for a positive pregnancy experience. Geneva, World Health Organization, Switzerland.
11. Pavord S, Myers B, Robinson S et al. UK guidelines on the management of iron deficiency in pregnancy. *Br J Haematol* 2012;156(5):588–600.
12. Aronoff GR. Safety of intravenous iron in clinical practice: implications for anemia management protocols. *J Am Soc Nephrol JASN*.2004; 15(Suppl 2):S99–S106.
13. Kriplani A, Mahey R, Dash BB, Kulshreshta V, Agarwal N, Bhatla N. Intravenous iron sucrose therapy for moderate to severe anaemia in pregnancy. *The Indian journal of medical research*. 2013 Jul;138(1):78.
14. Wali A, Mushtaq A, Nilofer. Comparative study - Efficacy, safety and compliance of intravenous iron sucrose and intramuscular iron sorbitol in iron deficiency anemia of pregnancy. *JPMA*. 2002;52:392–7.
15. Sood SK, Ramachandran K, Rani K, et al. WHO sponsored collaborative studies on nutritional anaemia in India. The effect of parenteral iron administration in the control of anaemia of pregnancy. *Br J Nutr* 1979;42:399–406.

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