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Original Article

Intravenous iron sucrose and intramuscular iron sorbitol for anemia during pregnancy

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ABSTRACT:

Background: The prevalence of anaemia is 55.9 per cent with variations between developed and developing countries. The present study was conducted to compare intravenous iron sucrose and intramuscular iron sorbitol for anemia during pregnancy. **Materials & Methods:** 120 antenatal women between 14 and 32 weeks of gestationwere divided into two groups. Group I received intravenous iron sucrose. Iron sucrose was given as 150 mg in 100 ml of 0.9 % normal saline infusion over 1 hour every third day and group II received intramuscular iron sorbitol therapy. Iron sorbitol complex was given as daily intramuscular injection of 1.5 ml.Each group had 60 patients. **Results:** Group I received intravenous iron sucrose and group II intramuscular iron sorbitol therapy. After 2 weeks of therapy hemoglobin level (gm/dl) 5-7 was seen in 15% and25%, 7-9 in 30% and 34%, 9-11in 55%and 41% and after 4 weeks in 12% and 20% and 48%, 74% and 40% and 6%in group I and II respectively. Time period Time period taken to achieve target hemoglobin level (>11 gm/dl) in group I and group II was 2-4 weeks in 7% and 0%, 4-8 wees in 80% and 35%, 8-12 weeks in 13% and 55% and >12 weeks in 0% and 10% in group I and II respectively. Adverse events in group I and group II were headachein 2 and 3, local phlebitis in 1 and 2, skin staining in 1 and 4 and abdominal pain in 1 and 3 respectively. **Conclusion:** Intravenous iron sucrose therapy for the treatment of anemia during pregnancyis safe, convenient, more effectivethan intramuscular iron sorbitol therapy.

Key words: hemoglobin, Intravenous iron sucrose, intramuscular iron sorbitol

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INTRODUCTION

Anemia is estimated to affect nearly two-third of the pregnant women in developing countries and iron deficiency anemia accounts for 95% cases.[1] It is the most common nutritional pathology in pregnant women. Among them, about 45 % of pregnant women suffer from moderate to severe anemia. Anemia is associated with high perinatal morbidity and mortality.[2]

Globally, the prevalence of anaemia is 55.9 per cent with variations between developed and developing countries.[3] In India, prevalence ranges between 33-89 per cent. About half of the global maternal deaths due to anaemia occur in South Asian countries; India contributes to about 80 per cent of this mortality ratio. Many programmes have been introduced and implemented to reduce the burden of anaemia in the country but the decrease is lower than other South Asian countries.[4]

Various parenteral iron preparations are available in the market which can be given either intravenously or intramuscularly.[5] Initially, iron dextran and iron sorbitol citrate was started. To treat these conditions, we require a relatively new mode of iron therapy with better efficacy, less side effects, fast action, and better compliance. Intravenous iron sucrose therapy seems to be a safe, convenient, and more effective treatment for anemia during pregnancy.[6]The present study was conducted to compare intravenous iron sucrose and intramuscular iron sorbitol for anemia during pregnancy.

MATERIALS & METHODS

The present study comprised of 120 antenatal women between 14 and 32 weeks of gestation. The consent was obtained from all enrolled patients.

Data such as name, ageetc. was recorded. All the cases were divided into two groups. Group I received intravenous iron sucrose. Iron sucrose was given as 150 mg in 100 ml of 0.9 % normal saline infusion over 1 hour every third day and group II received intramuscular iron sorbitol therapy. Iron sorbitol complex was given as daily intramuscular injection of 1.5 ml.Each group had 60 patients. A thorough history taking, general, systemic, and obstetrical examination was performed. All the cases were monitored for adverse effects.Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Groups	Group I	Group II
Drug	intravenous iron sucrose	intramuscular iron sorbitol therapy
Number	60	60

Table I shows that group I received intravenous iron sucrose and group II intramuscular iron sorbitol therapy.

Table II Comparison of hemoglobin level in both groups

Hemoglobin (gm/dl)	After 2 weeks		After 4 weeks	
	Group I	Group II	Group I	Group II
5-7gm/dl	15%	25%	0	12%
7-9gm/dl	30%	34%	20%	48%
9-11gm/dl	55%	41%	74%	40%
>11gm/dl	0	0	6%	0
P value	0.01		0.02	

Table II, graph I shows thatafter 2 weeks of therapy hemoglobin level (gm/dl)5-7 was seen in 15% and 25%, 7-9 in 30% and 34%, 9-11 in 55% and 41% and after 4 weeks in12% and 20% and 48%, 74% and 40% and 6% in group I and II respectively. The difference was significant (P< 0.05).

Graph I Comparison of hemoglobin level in both groups

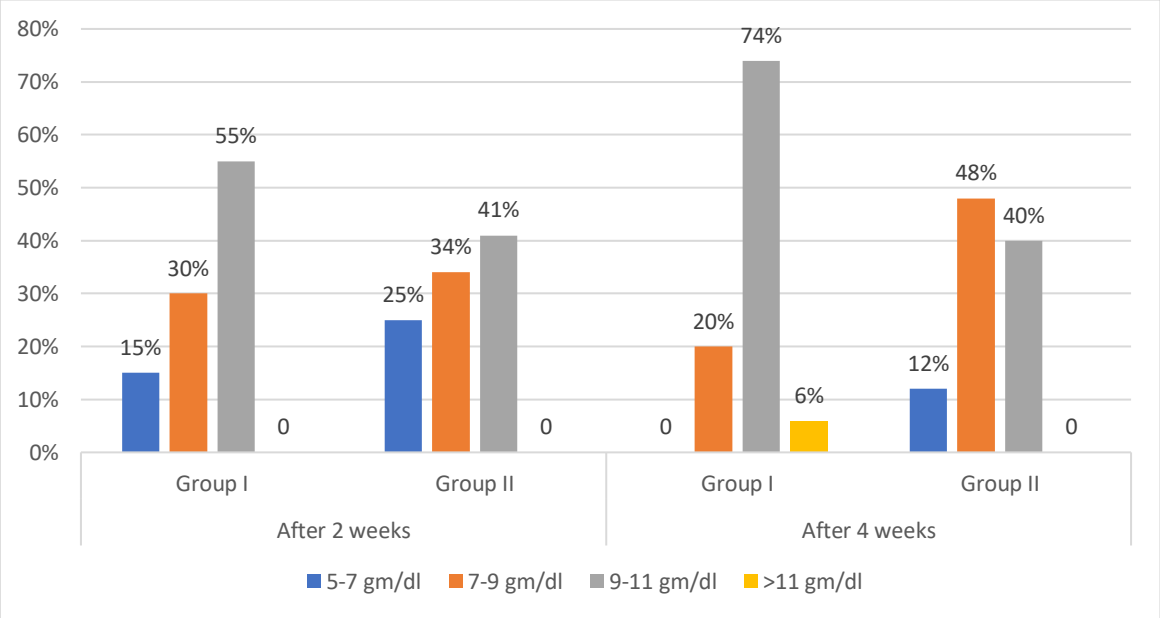

Table III Time period taken to achieve target hemoglobin level(>11 gm/dl)

Time period (weeks)	Group I	Group II	P value
2-4	7%	0	0.01
4-8	80%	35%	
8-12	13%	55%	
>12	0	10%	

Table III shows that time period taken to achieve target hemoglobin level (>11 gm/dl) in group I and group II was 2-4 weeks in 7% and 0%, 4-8 wees in 80% and 35%, 8-12 weeks in 13% and 55% and >12 weeks in 0% and 10% in group I and II respectively. The difference was significant (P< 0.05).

Table IV Adverse events

Adverse events	Group I	Group II	P value
Headache	2	3	0.01
Local phlebitis	1	2	
Skin staining	1	4	
Abdominal pain	1	3	

Table IV shows that adverse events in group I and group II were headache in 2 and 3, local phlebitis in 1 and 2, skin staining in 1 and 4 and abdominal pain in 1 and 3 respectively. The difference was significant (P< 0.05).

DISCUSSION

The first choice for prophylaxis and treatment of mild iron deficiency anaemia in pregnancy is oral iron therapy.[7] But in patients with moderate and severe anaemia, oral therapy takes long time and compliance is a big issue in our country.[8] Thus, pregnant women with moderate anaemia should be better treated with parentral iron therapy and/or blood transfusion depending upon individual basis (degree of anaemia, haemodynamic status, period of gestation, etc.).[9] Various parenteral iron preparations are available in the market which can be given either intravenously or intramuscularly. Initially, iron dextran and iron sorbitol citrate was started.[10] But test dose was required to be given before these injections as severe anaphylactic reactions were reported with intravenous iron dextran. Iron sucrose has been reported to be safe and effective during pregnancy. The injection can be given without test dose.[11]The present study was conducted to compare intravenous iron sucrose and intramuscular iron sorbitol for anemia during pregnancy.

We found that group I received intravenous iron sucrose and group II intramuscular iron sorbitol therapy. Kriplani et al[12]evaluated the response and effect of intravenous iron sucrose complex (ISC) given to pregnant women with IDA.One hundred pregnant women with haemoglobin between 5-9 g% with diagnosed iron deficiency attending antenatal clinic were given intravenous iron sucrose complex in a dose of 200 mg twice weekly schedule after calculating the dose requirement.The mean haemoglobin raised from 7.63 ± 0.61 to 11.20 ± 0.73 g% (P<0.001) after eight weeks of therapy. There was significant rise in serum ferritin levels (from 11.2 ± 4.7 to 69 ± 23.1 μg/l). Reticulocyte count increased significantly after two wk of starting therapy (from 1.5 ± 0.6 to 4.6±0.8%). Other parameters including serum iron levels and red cell indices were also improved significantly. Only one woman was lost to follow up. No major side effects or anaphylactic reactions were noted during study period.

We found that after 2 weeks of therapy hemoglobin level (gm/dl) 5-7 was seen in 15%and 25%, 7-9 in 30% and 34%, 9-11in 55%and 41% and after 4 weeks in 12% and 20% and 48%, 74% and 40% and 6%in group I and II respectively. Al-Momen et al[13]determined efficacy of intravenous iron sucrose complex (ISC) as compared with oral ferrous sulfate in the treatment of iron deficiency anemia during pregnancy.Each study patient was given the total calculated amount of ICS (Hb deficit (g/l) x body weight (kg) x 0.3) in divided doses (200 mg (elemental iron) in 100 ml normal saline intravenously over 1 h daily) followed by 10 mg/kg to replenish iron stores. Each patient of the control group was given ferrous sulfate 300 mg (60 mg elemental iron) orally three times a day. All patients were monitored for adverse effects, clinical and laboratory response.There were 52 patients and 59 controls. ISC group achieved a significantly higher Hb level (128.5 +/- 6.6 g/l vs. 111.4 +/- 12.4 g/l in the control group P < or = 0.001) in a shorter period (6.9 +/- 1.8 weeks vs. 14.9 +/- 3.1 weeks in the control group, P < or = 0.001). ISC complex group showed no major side effects while 4 (6%) of the control group could not tolerate ferrous sulfate, 18 (30%) complained of disturbing gastrointestinal symptoms and 18 (30%) had poor compliance.

We found that time period taken to achieve target hemoglobin level (>11 gm/dl) in group I and group II was 2-4 weeks in 7% and 0%, 4-8 wees in 80% and 35%, 8-12 weeks in 13% and 55% and >12 weeks in 0% and 10% in group I and II respectively. We found that adverse events in group I and group II were headachein 2 and 3, local phlebitis in 1 and 2, skin staining in 1 and 4 and abdominal pain in 1 and 3 respectively. Singh et al[14]in their study 100 antenatal cases of gestational age 14–32 weeks. Cases were randomly divided into two groups. Group A, having 50 cases received intravenous iron sucrose, and 50 cases in Group B received intramuscular iron sorbitol. Response to therapy in both groups was studied and compared. The mean pretherapy hemoglobin in group A was 6.49 gm/dl and in group B was 6.48 gm/dl. The rise in hemoglobin after 4 weeks of starting therapy was 3.52 gm/dl in group A and 2.33 gm/dl in group B. The difference was statistically significant (P\0.01). The mean time taken to achieve target hemoglobin (C11 gm/dl) was 6.37 weeks in group A and 9.04 weeks in group B. In group A, 8 % (four) cases had grade I adverse effects. In group B, 24 % (12) cases had grade I adverse effects. The difference was statistically significant (P = 0.027). In both the groups, no case discontinued the therapy.

CONCLUSION

Authors found that

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