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Research Article

EVALUATION OF IRON SUCROSE FOR POST PARTUM ANEMIA

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ABSTRACT

A randomized study was conducted in 50 patients of postpartum iron deficiency anaemia with Haemoglobin 6-8 gm and S.Ferritin <15µg/L .These patients were divided into two groups. Group I received oral iron sulphate 200mgm thrice a day for 4 weeks and Group II received a fixed dose of IV iron sucrose 100mgm daily for 3 days. Haemoglobin, Serum Ferritin was estimated before treatment and after 4weeks of treatment. There was significant rise of Haemoglobin and Serum Ferritin in group II patients.

Key Words: *Iron Sucrose, Post Partum Iron Deficiency Anemia*

INTRODUCTION

Postpartum anaemia is a serious health issue & yet goes unnoticed and untreated. Mothers are at increased risk of postpartum anaemia if they had less spacing during pregnancies, antepartum anemia and lack of iron supplementation and loss of large amount of blood during childbirth (Bergmann *et al.*, 2010) or had twins/multiple births. Postpartum iron deficiency is associated with fatigue, physical disabilities, postpartum blues, reduced cognitive abilities (Milman, 2012) and significant health problem in women of reproductive age. Neonatal effects can be anemia in new born & failure to thrive due to maternal ill health. Incidence of anemia in pregnancy varies from 14% in developed and 51%% in developing countries In India its incidence is 65%-75% (Kalavani, 2009). Prevalence of anaemia in an ICMR study covering 11 states was 87.65%. According to WHO 56% women suffer postpartum anaemia. In India maternal mortality has been reported to be 19% due to anemia. Fortunately postpartum anaemia can be prevented and is treatable. If untreated the woman will start the next pregnancy with iron deficit increasing the morbidity and mortality in pregnancy. Hence it is important to treat postpartum anemia.either by oral iron or parentral iron or even blood transfusion in severe cases.

METHODS

Randomised longitudinal study was done on 50 postpartum women with haemoglobin 6-8gm% and S. ferritin <15 µg/L.Women with hypersensitivity/intolerance to oral or parentral iron, liver or renal disorders, acute infections were excluded from study. Patients with risk factor for anaemia like aspirin intake, hookworm infestation, history of piles etc. were also excluded from the study. Patients were randomly assigned into two groups. In the first group 25 patients received 100mg ferrous sulphate (containing 60mg elemental iron) thrice daily for 4 weeks one hour after meal from day 2-3 post delivery (vaginal/caesarean). In the second group of 25 patients, a fixed dose of intravenous iron sucrose i.e. 100mg diluted in 100 ml.normal saline was given daily for 3 days making total irrespective of their total iron requirements. All the patients were supplemented with 5 mgm of folic acid to eliminate effects of folic acid deficiency. Haemoglobin, haematocrit, reticulocyte count and S.ferritin were estimated and recorded before and after 4 weeks of treatment in both the groups. Side effects of both oral & intravenous iron were recorded. Complaince in oral group was assured by asking colour of stools and checking the empty packets of iron tablets given at time of discharge.

RESULTS

Unbooked women (64-88%), low socioeconomic status (48%), Hindu community (64-72%) and primipara (64%) were most affected women.with postpartum anemia in our study. Maximum number of patients (about 44%) in oral iron group (groupI) had baseline haemoglobin 7.6-8.0 gm/dl and mean haemoglobin 7.43 ± SD 0.46 gm/dl. After treatment, mean hemoglobin rose to 8.20±SD 0.48 gm/dl.

In comparison, group II i.e. intravenous iron group had maximum patients with hemoglobin ranged 6.6 -7.0 gm% and mean haemoglobin rise was 8.5± SD 0.49 gm/dl from pretreatment value 7.27±SD 0.40 gm/dl (Table 1).The rise of Hb% in group II was significant compared to rise in Hb% in group I (Pvalue <.05).

Table 1: Distribution of patients according to Hb% before and after treatment, Mean Hb%levels

Hb%	Oral iron group		IV Iron group	
	Before treatment	**After treatment**	**Before treatment**	**After treatment**
6 – 6.5	4%(1)	Nil	4%(1)	Nil
6.6 – 7.0	16%(4)	Nil	44%(11)	Nil
7.1 -7.5	36%(9)	16%(4)	28%(7)	4%(1)
7.6 – 8.0	44%(11)	12%(3)	24%(6)	20%(5)
8.0 -8.5	Nil	48%(12)	Nil	36%(9)
8.6 – 9.0	Nil	24%(6)	Nil	40%(10)
Mean Hb%	7.43±SD0.46	8.2±SD0.48	7.27±SD0.40	8.5±SD0.49

Maximum number of patients in both the groups had haematocrit values of 21-25%. The mean baseline haematocrit in both the groups was comparable. Following treatment, hematocrit rise was seen in both groups but significant change was observed in intravenous group.40% patients in oral group had hematocrit rise to 26- 35% and 80% patients in intravenous group had hematocrit values of 26-35% after treatment (Table 2)

Table 2: Distribution of patients according to haematocrit and mean haematocrit in both the groups

Haematocrit (%)	Oral group		IV Group	
	Before treatment	**After treatment**	**Before treatment**	**After treatment**
14 -20	16%(4)	Nil	32%(8)	Nil
21 -25	48%(12)	16%(4)	40%(10)	8%(2)
26 -30	12%(3)	40%(10)	12%(3)	40%(10)
31 -35	24%(6)	32%(8)	16%(4)	40%(10)
36 - 40	Nil	12%(3)	Nil	12%(3)
Mean	25.42+SD5.13	30.45+SD4.17	23.22+SD6.25	30.67+SD4.63

The mean baseline reticulocyte count was 0.72+/-SD 0.33% in oral group and 0.93+±SD0.34% in IV group (Table 3). After treatment mean reticulocyte count in oral group was 1.53±SD 0.64% and

1.77±SD0.53% in IV group.The increase of reticulocyte count was significant in the IV iron group (Pvalue <0.0054) compared to oral iron group (Table 3).

Table 3: Mean values of various blood indices before and after treatment

Mean values	Oral iron group		IV iron group	
	Before treatment	**After treatment**	**Before treatment**	**After treatment**
Reticulocyte%	0.72±0.33	1.50±0.64	0.93±0.34	1.77±0.53
MCV(fl)	72.16±12.1	82.09±7.71	73.90±6.86	82.50±6.99
MCH(Pg)	24.34±5.16	32.72±4.34	25.57±4.43	33.48±4.35
MCHC(gm/dl)	32.22±4.03	37.79±4.94	31.75±4.56	37.17±4.24
S.ferritin(µg/L)	12.48±.60	25.04±4.86	12.21±2.09	27.00±3.25

Baseline mean Serum ferritin rose from12.48+/-SD1.60 microgm/dl to 25.04+/-SD 4.86microgm/dl after treatment in the oral iron group whereas mean S.ferritin rose from 12.21+/-SD2.09microgm./dl to 27.00 +/-SD3.25microgm/dl.in the IV iron group.The rise in S. Ferritin was significant in the IV iron group (P value <0.0096).

Regarding side effects, the oral iron group mainly had gastrointestinal side effects (in 36% patients). Allergic reaction was seen in 8% of patients of IV iron group which subsided with medication or on its own however these were not observed in oral iron group.

Table 4: Side effects of oral iron and IV iron sucrose

Side effects	Oral group	IV iron group
Nausea,vomiting	8%(2)	Nil
Abdominal pain	4%(1)	Nil
Constipation	20%(5)	Nil
Diorrhoea	4%(1)	Nil
Rash	Nil	4%(1)
Chills	Nil	4%(1)
Dizziness	Nil	4%(1)
Anaphylactic shock	Nil	Nil

DISCUSSION

Post partum anemia treatment is a very important issue that needs aggressive treatment to build up iron reserves in the puerpurae, to have a better quality of life and also ensures to minimise incidence of anemia in next pregnancy. A search for a method to treat post partum anemia is therefore being evaluated in our study and the results being compared to other studies. Our study is in corroboration with trial in women's centre, John Radcliffe Hospital, Oxford, UK. In the two groups with oral ferrous sulphate 200mg twice daily and two doses of intravenous iron sucrose on day 2 and 4 respectively postpartum hemoglobin level had risen from 7.3+0.9 to 9.9 +0.7 g/dl. Bayoumeu *et al.*, (2002) reported rise in haemoglobin from 9.6+.79gm/dl to 11.11+1.3 in IV group and from9.7+.5to11.0+1.25in oral

group at day 30. However Bhandal N and Russel R on day 40 after treatment found no difference in haemoglobin levels between the two groups. Significant rise in haematocrit was also seen in a study by Dede *et al.,* (2005) where the mean haematocrit increased from 24.9+/-SD2.4 to51.6+/-SD7.2 in IV group as compared to 25.1+/-2.54 to 36.5+/-2.0 in oral group at 28 days of treatment. Increased reticulocyte response observed with IV iron in our study is similar to that observed by Bayoumeu *et al.,* (2002) where no statistical significant increase was found at days 8,15,21 in the two groups but significant increase was observed at day 30 (P value 0.027) with IV iron. Breyman *et al.,* (2005) and Momen *et al.,* (1996) also found increased MCV and MCH with IV 800 mgm iron sucrose. Our studies are similar to a study by Bhandal and Russel (2006) done on postpartum women where a statistical significant increase in S.ferritin levels was observed between the baseline values of 13microgm/dl to 42.2microgm/dl on day 40 in IV iron group. Similar significant rise was observed by Breyman *et al.,* (2005) Momen *et al.,* (1996), Bayoumeu *et al.,* (2002) with the iron sucrose group.

Conclusion

It is important to treat post partum anemia for maternal and neonatal health and to ensure good iron status before a new pregnancy starts. Intravenous iron sucrose helps to built up a significant increase in hemoglobin, serum ferritin and reticulocyte count and blood indices. There were few allergic reactions (rash, chill and dizziness) and no gastric side effects. Intravenous iron sucrose is effective, convenient, safe route to cure postpartum anemia with 100% compliance as compared to oral iron supplementation. The hospital stay of postpartum women thus can be effectively utilized by giving a fixed dose of intravenous iron sucrose in three daily doses of 100mgm.

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