Original Article

Comparison of the Efficacy of IV Iron versus Oral Iron Therapy in Postpartum Anemia

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ABSTRACT

Objective: To compare the efficacy of parenteral and oral iron therapy in post partum anemia.
Study Design: Randomized controlled trial study
Place and Duration of Study: This study was conducted at the Department of Obstetrics and Gynaecology, Bahawal Victoria Hospital, Bahawalpur from 1st August 2017 to 31 January 2017.
Materials and Methods: A total of 82 patients with postpartum anemia, having age range of 20 to 35 years were included in the study. The patients were randomly placed into two groups i.e. Group A (intravenous iron) and Group B (oral iron), by using lottery method. All patients were followed till 6 weeks and efficacy (deemed as yes if there was rise in hemoglobin levels >3.5g/dl after 6 weeks of therapy) was noted.
Results: There was rise in hemoglobin levels >3.5g/dl after 6 weeks of the rapy in 36 patients in intravenous route foe iron therapy while in oral route, it was seen in 27 patients. So, efficacy was 87.80% in group A (intravenous iron) and 65.85% in group B (oral iron) with p-value of 0.018.
Conclusion: Intravenous iron therapy is more effective than oral iron in treating postpartum anemia due to good compliance and better tolerance.

Key Words: Iron deficiency anemia, hemoglobin, parenteral iron,oral iron

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INTRODUCTION

Anemia is defined as level of haemoglobin falling 11gm/dl and a haematocrit of less than 33%.[1] Mild to moderate anemia is associated with vague symptoms like tiredness, weakness, easy fatiguability or shortness of breath. Anemia that is severe has greater symptoms which may include: confusion, dizziness, inability to concentrate and an increased desire to drink fluids. There may be additional symptoms depending on the underlying cause.[2]

Anemia in pregnancy accounts indirectly for 40-60% of the maternal deaths in the developing countries.[3] Its incidence is 18% in pregnant women of the developed and 35- 75% of pregnant women in developing countries.[1,4] Postpartum mild anemia i.e. haemoglobin (Hb) levels of <10 g/dl is seen in up to 30% of women, severe anaemia (Hb <8 g/dl) seen in 10%.[5] The main cause of anemia is iron deficiency because of the iron deficit that occurs because of increased iron consumption to fulfil the increased iron demand by the placenta and growing fetus and also increased red cell mass in patients.[6] This fall in iron levels are usually recovered in 4-6 weeks postpartum but the women belonging to low socioeconomic class remain at increased risk to suffer from anemia in post partum period for a longer time. Lately oral iron therapy, intramuscular iron therapy, intravascular iron therapy and blood transfusion have been used to treat anemia during pregnancy and in postpartum period[7] because of the risks of blood transfusion and financial constraints, oral (by mouth) and parenteral (by intravenous, intramuscular or subcutaneous injection) have remained attractive.

The oral iron has remained first line of treatment because of easy availability and easy administration.[8] Ferrous sulfate among all available preparations is used mostly.[9] In conditions where oral iron therapy is not effective because of increased demand, poor compliance or poor tolerance as seen in patients with inflammatory bowel disease (e.g. ulcerative colitis, Crohn disease), need arises for parentral iron therapy in anemic pregnant and post natal women. intravenous iron has been used safely and effectively.[10] The intravenous iron therapy,can provide a greater and more rapid iron supply than oral iron supplementation.[6,11]

As there was no local study available on this so, this study was conducted to compare the efficacy of intravenous iron therapy with oral iron therapy in postpartum anemia in local population, so our population might get benefit. Moreover, the results of this study would provide us with more efficacious regimen among two for managing postpartum anemia.

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MATERIALS AND METHODS

This randomized controlled trial study was carried out at Department of Obstetrics and Gynaecology, Bahawal Victoria Hospital, Bahawalpur from 1st August 2017 to 31 January 2017. A total of 82 patients with postpartum anemia, having age range of 20 to 35 years were included in the study. The patients were randomly placed into two groups i.e. Group A (intravenous iron) & Group B (oral iron), by using lottery method.

Group A received intravenous iron over 30 minutes,200mg repeated weekly in 100 ml of normal saline0.9%) . Group B received oral iron (tab. Ferrous sulfate, 325 mg three times daily by mouth for 6 weeks). All patients were followed till 6 weeks and efficacy (deemed as yes if there was rise in hemoglobin levels >3.5g /dl after 6 weeks of therapy) was noted by the researcher. The data was entered and analyzed by SPSS-20.

RESULTS

In group A average age of patients was 26.36±4.30 years and in group B it was 26.31±4.69 years on an average, with majority of the patients 41 (50%) in age range of 20 to 25 years as shown in Table 1. Tables 2 & 3 showed the number and % of patients according to parity and haemoglobin levels respectively. 36 (87.80%) patients in Group A (intravenous iron) showed a rise in hemoglobin levels >3.5g/dl after 6 weeks of therapy while 27 (65.85%) patients in Group B (oral iron), So, efficacy was 87.80% in group A (intravenous iron) and 65.85% in group B (oral ir on) with p-value of 0.018 as shown in Table 4. Table 5 shows stratification of age groups with respect to efficacy while Table 6 has shown the hemoglobin levels stratification with respect to efficacy.

Table No.1: Frequency and percentage of age (n=82)

Age (years)	Group A (n=41)		Group B (n=41)	
	No.	%	No.	%
20-25	20	48.78	21	51.22
26-30	13	31.71	11	26.83
31-35	8	19.51	9	21.95
Mean±SD	26.36±4.30		26.31±4.69	

Table No.2: Frequency and percentage of parity (n=82)

Parity	Group A (n=41)		Group B (n=41)	
	No.	%	No.	%
1	8	19.51	9	21.95
2	13	31.71	13	31.71
3	11	26.83	12	28.27
4	6	14.63	5	12.19
5	3	7.32	2	4.88

Table No.3: Percentage of patients according to hemoglobin levels

Hemoglobin level (mg/dl)	Group A (n=41)		Group B (n=41)	
	No.	%	No.	%
≤ 7	22	53.66	18	43.90
>7 <10	19	46.34	23	56.10
Mean±SD	7.11±1.37		7.46 ± 1.23	

Table No.4: Efficacy in Group A compared with Group B

Efficacy	Group A (n=41)		Group B (n=41)	
	No.	%	No.	%
Yes	36	87.80	27	65.85
No	5	12.20	14	34.15
P value	0.018			

Table No.5: Stratification of age groups with respect to efficacy

Age (years)	Group A		Group B		P value
	Yes	No	Yes	No	
20-25	18 (90%)	2 (10%)	13 (61.9%)	8 (38.1%)	0.036
26–30	11 (84.6%)	2 (15.4%)	7 (63.7%)	4 (36.4%)	0.237
31-35	7 (87.5%)	1 (12.5%)	7 (77.8%)	2 (22.3%)	0.600

Table No.6: Stratification of hemoglobin levels with respect to efficacy

Hb level (mg-dl)	Group A		Group B		P value
	Yes	No	Yes	No	
≤ 7	18 (81.8%)	4 (18.2%)	10 (55.6%)	8 (44.5%)	0.071
>7-<10	18 (94.8%)	1 (5.3%)	17 (73.9%)	6 (26.1%)	0.071

DISCUSSION

A lot of energy is required in post natal period while recovering, taking care of the new born .Tiredness is expected after childbirth but is alarming when lasts more than six weeks after delivery and keeps the woman from performing normal routine. These symptoms if present depict post partum anemia. Iron deficiency being the most likely cause. The risk factors for developing post partum anemia are if the woma n was having iron deficiency anemia in antenatal period, had large amount of blood loss, twin pregnancy or low socioeconomic class.[19] The additional symptoms for this condition include dizziness, easy fatiguability, infections ,problems with breast feedin g and thus a longer hospital stay.[13]

Oral iron supplementation is the first line of management for post partum anemia but non compliance and intolerance seen in gastrointestinal upset are its main limitations.[14] Alternative treatment methods for anemia include intravenous (IV) iron therapy or blood transfusion. Blood transfusions are very costly and risky, inclining the choice of treatment towards IV iron therapy.[15]

Hemoglobin and ferritin measure the effect of therapy and they are rapidly elevated after IV iron use improving the general condition of the patients and also replenishing the iron stores of the body. Out of many options available, IV iron therapy with Iron Sucrose has better availability and larger safety data.[16] Intravenous iron is administered in a dose of 200 mg in 100 ml of normal saline 0.9% over 30 minutes safely. Some authors are convinced about rapid improvement in haemoglobin and better replenishment of iron stores after IV iron use particularly iron sucrose for iron deficiency anaemia in pregnancy as compared with oral therapy.[6,17]

In the present study 36 (87.80%) patients in Group A (intravenous iron) showed a rise in hemoglobin levels >3.5g/dl after 6 weeks of therapy while 27 (65.85%) patients in Group B (oral iron). So, efficacy was 87.80% in group A (intravenous iron) and 65.85% in group B (oral iron) with p-value of 0.018.

In a similar study by Aggarwal et al[18] intravenous iron therapy was found more effective in achieving target hemoglobin in 80% patients as compared to only 40% observed in oral iron group. Bayomeu et al[20] in France conducted a prospective ,random study involving 50 patients at 6 month of gestation, comparing intravenous iron sucrose versus oral route, showed an increase in haemoglobin from 9.6±0.7 g/dl to 11.11±1.3 g/dl after 4 weeks of treatment (P<0.001)in IV route group. Van Wyck et al[12] in his study has shown the efficacy i.e. improvement in targeted hemoglobin levels, of intravenous iron as 90.5% and oral iron therapy as 68.6% in postpartum anemia.

Halimi et al[1] in his study showed a rise in hemoglobin concentration from 9.35±1.62 to 11.20±0.28 gm/dl in oral group and from 9.20±1.69 to 12.65±1.06 gm/dl in intravenous group on day 30.

Breymann et al[11] concluded intravenous iron as a safe and effective treatment option for patients with postpartum iron deficiency anemia, IV iron is better tolerated ,ensures compliance and rapid achievement of the target haemoglobin.

In another study mean Hb level increased from 7.5 to 11gm/dl by IV iron sucrose in iron deficiency anemia of pregnancy. It was carried out by Raja et al[21] at Rawalpindi. On the whole it is concluded that intravenous iron is the preferred route of administration in treating iron deficiency anemia in pregnant women as it is more efficacious in terms of rise in hemoglobin levels.

CONCLUSION

This study concluded that intravenous iron therapy is more effective than oral iron in treating postpartum anemia due to good compliance and better tolerance.

Author's Contribution:

Concept & Design of Study:	Sidrah Batool
Drafting:	Khiaynat Sarwar Hahsmi
Data Analysis:	Khiaynat Sarwar Hahsmi, Mahham Janjua
Revisiting Critically:	Sidrah Batool, Khiaynat Sarwar Hahsmi
Final Approval of version:	Sidrah Batool

Conflict of Interest: The study has no conflict of interest to declare by any author.

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