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Comparison of Oral and Parenteral Iron Therapy in Postpartum Anemia

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ABSTRACT

Objective:

To create a comparison between the efficiency of intravenous ferrous sucrose and Oral ferrous sulphate, present in postpartum iron deficiency anemia.

Study Design: Randomized control experimental study.

Place and Duration of the Study: The span of this study started from May 1st, 2018- December 30th 2018, and took place at Postoperative and PostNatal Ward of Surgimed Hospital, Lahore.

Materials and Methods: Around 50 cases of postpartum iron deficiency anemia assembled for this analysis and were further classified in two groups of 25 participants each. Group A was administered 200 mg of intravenous ferrous sucrose on second and fourth day of delivery (two doses). Group B cases were given 200 mg of oral ferrous sulphate daily for 6 weeks. Follow up took place at fifteenth and 40th of postpartum, regarding an increase in ferritin level and hemoglobin.

Results: In group A the mean Hb was 8.21±0.37 gm/dl within 24-48 hours of delivery and 8.69±0.59 gm/dl in group B. In Group A the mean serum ferritin level was 10.99±1.54 mcg/L and 11.54±0.78 mcg/L in group B. In group A, the mean Hb after 15 days follow up was 10.11±1.23 gm/dl and in group B 9.89±0.52 gm/dl and in group A, the mean serum ferritin level was 33.12±3.12 mcg/L and in group B 14.69±0.89 mcg/L. In group A, the mean Hb after 40 days follow up was 11.99±0.68 gm/dl and in group B was 11.22±0.41 gm/dl and in group A, the mean serum ferritin level was 45.99±3.89 mcg/L and in group B was 16.79±1.22 mcg/L.

Conclusion: Intravenous iron sucrose therapy increases the Hb level as well as serum ferritin level swiftly in comparison with oral ferrous sulphate in women with postpartum anemia deficiency anemia.

Key Words: oral iron therapy, Postpartum anemia, intravenous iron therapy, anemia, iron deficiency

INTRODUCTION

Anemia is a serious global health issue, children and pregnant, lactating women being the most vulnerable. Lack of iron deficiency leads to anemia, trailed by the deficiency of folate during pregnancy and postpartum. It has an impact on health of 50-60% pregnant women in developing nations while 18% in developed countries. It is also

a crucial factor in a reduced work capacity and also leads to maternal morbidity.

Postpartum hemoglobin (Hb)

Postpartum Iron deficiency anemia has a strong impact on socio and economic aspects of a female's quality of life, it may cause a damp on her potential to carry out household tasks and take care of her children. It also known to be a major cause of reduced exercise tolerance, reduced physical and mental work, depression, impaired wound healing, depression and death. Depending upon the severity and cause, Oral iron, intravenous iron and blood transfusion has been utilized to treat iron deficiency Anemia. There are numerous risks of allogeneic blood transfusion that limits its utilization in extreme anemia. In order to classify patients in two categories (normal and abnormal, for iron store purpose) Ferritin and HB assessment have been clinically used. Gastrointestinal effects by the consumption of oral supplementation leads to poor compliance, although it is widely consumed. Some major symptoms of parenteral iron therapy are refusal of blood transfusion, intolerable gastrointestinal side effects, inadequate intestinal absorption. However iron sucrose has proved to be harmless and effectual in anemic pregnant and postpartum cases, as it has little allergic reaction and gradual release of elementary ferrous production from the complex. There are no adverse reactions of intravenous iron treated for iron deficiency anemia of pregnancy instead it showed tendency to restore iron stores more effectively yet faster than that of oral iron. If the oral iron is endurable, then parental therapy do not offer advantage over oral iron supplementation. Parental iron therapy is advantageous of its administration; improve HB deficit and increases iron stores. The purpose of this analysis is to create a contrast between the efficiency of intravenous ferrous sucrose and oral ferrous sulphate in postpartum iron deficiency anemia.

MATERIALS AND METHODS

A randomized controlled trial, regulated at postnatal and postoperative wards of Surgimed Hospital, Lahore, from May 1st, 2018- December 30th, 2018. Non-probability convenient technique was used for sampling. Women suffering from



postpartum anemia (hemoglobin < 10gm/dl to 7gm/dl and ferritin level < 15 .microgram/l) at 24-48 hours of delivery and those who deliver Singleton were added in the study. Women with comorbidities (sepsis, renal, infections, hectic diseases) and those underwent blood transfusion were excluded. There was a selection of 50 anemic cases from post natal and post operative Ward of Surgimed Hospital, Lahore, following the 24 hours of delivery and were further classified into two groups of 25 cases each. An informed consent was acquired by the patients and the collected data was included in the study. Analysis of red cell indices, hemoglobin %, serum ferritin level and peripheral blood smear was conducted within the 24-48 hours of delivery and on 15th and 40th day after treatment. There were two groups of patients, labeled as Group A and Group B by utilizing a random table number. Group A was administered intravenous ferrous sucrose 200 mg on second and fourth day of delivery(only two doses) while ferrous sucrose was given as an infusion in 100 ml 0.9% sodium chloride solution for half an hour after test dose. The increased rate of hemoglobin and ferritin level was observed on 15th and 40th day of postpartum.

The data was entered and analyzed by using Spss v.10. The applicable variables were compromised of parity, age, duration of marriage, hemoglobin before delivery, present hemoglobin and serum ferritin. They were classified as proportions and frequencies, producing mean and standard deviations for categorical variable. Increased hemoglobin and ferritin levels (the outcome variables) were taken into record. A comparison between the two treatments was studied and its difference was tested by applying student t-test, for

statistical significance. A p-value of 0.05 or below was agreed as significant.

RESULTS

50 patients suffering from iron deficiency anemia post delivery were included for this analysis, and were further divided in two Groups of 25 patients each. Group A was given intravenous ferrous sucrose therapy, while Group B was administered oral ferrous sulphate therapy. The mean age of the patients in group A was 28.12 ± 2.44 years and mean age of the patients in group B was 27.34 ± 2.14 years.

In the parity, in group A, there were 12 (48%) patients of primigravida and 15 (60%) patients of multi gravida and in group B, 13 (52%) patients of primigravida and 14 (56%) patients of multi gravida

In presenting symptoms, in group A, there were 23 (92%) patients of weakness, 14 (56%) patients of palpitation, 11 (44%) patients of lethargy, 4 (16%) patients of lack of concentration, 3 (12%) patients of dizziness and 8 (32%) patients of dyspnea and in group B, there were 21 (84%) patients of weakness, 5 (20%) patients of palpitation, 7 (28%) patients of lethargy, 3 (12%) patients of lack of concentration, 5 (20%) patients of dizziness and 2 (8%) patient of dyspnea.

In group A, the mean Hb within 24-48 hours of delivery was 8.21 ± 0.37 gm/dl and in group B was 8.69 ± 0.59 gm/dl. In group A, the mean HB after 15 days follow up was 10.11 ± 1.23 gm/dl and in group B was 9.89 ± 0.52 gm/dl. In group A, the mean HB after 40 days follow up was 11.99 ± 0.68 gm/dl and in group B was 11.22 ± 0.41 gm/dl.

Table 1: Comparison of mean hemoglobin levels in followup period

Follow up	Group A (Intravenous) n=25	Group B (Oral) n=25	p value
	Hemoglobin (gm/dl)	Hemoglobin (gm/dl)	
Within 24-48 hours	8.21 ± 0.37	8.69 ± 0.59	0.0001
At 15 th day	10.11 ± 1.23	9.89 ± 0.52	0.02
At 40 th day	11.99 ± 0.68	11.22 ± 0.41	0.0001

The mean ferritin within 24-48 hours of delivery was 10.99 ± 1.54 mcg/l in group A and in group B, it was 11.54 ± 0.78 mcg/l. In group A, the mean serum ferritin level after 15 days follow up was 33.12 ± 3.12 mcg/l and in group B was 14.69 ± 0.89 mcg/l. In group A, the mean serum ferritin level after 40 days follow up was 45.99 ± 3.89 mcg/l and in group b was 16.79 ± 1.22 mcg/l.



Table 2: Comparison of mean ferritin levels in followup period

Follow up	Group A (Intravenous) n=25	Group B (Oral) n=25	p value
	Hemoglobin (gm/dl)	Hemoglobin (gm/dl)	
Within 24-48 hours	10.99±1.54	11.54±0.78	0.02
At 15 th day	33.12±3.12	14.69±0.89	0.0001
At 40 th day	45.99±3.89	16.79±1.22	0.0001

DISCUSSION

The current analysis was conducted on anemic patients to compare the difference of results between the utilization intravenous ferrous sucrose and usage of standard treatment with oral iron. As to see whether intravenous method proves to be efficient than oral iron. According to our analysis the mean hemoglobin within 24-48 hours of delivery was 8.21±0.37gm/dl in group A and 8.69±0.59gm/dl in group B. When compared with the analysis of Bhandal and Russel that within 24-48 hours of delivery, mean hemoglobin was 7.50±0.80 gm/dl in intravenous group and 7.30±0.90 gm/dl in oral group, which matches with our record. On day 15th and 40th We can observe a surge in levels of hemoglobin in both treated groups but was notably higher in Intravenous Group. On the follow up (day 15th) the mean Hb increase was 1.9 gm/dl in group A and 1.2 gm/dl in group B, similarly in the study of Van Wick et al on 15 days follow up the mean Hb increase was 3.0 gm/dl in intravenous group and 2.0 gm/dl in oral group, which matches with our record as intravenous ferrous sucrose increases blood hemoglobin levels than that of oral iron supplementation, also increases store levels.

Intravenous iron significantly increased hemoglobin concentration and decreased risk for

red-cell transfusion in anemic patients. This conceivable benefit is remunerated by a potential risk of disease. Our study reveals serum ferritin level increased significantly only in the intravenous group and in the oral group. Comparable results were acquired by the Bhandal and Russel⁴ due to intravenous ferrous sucrose produces increase or rapidly blood hemoglobin levels than oral iron supplementation and apparently increases iron stores expeditiously. The rate of production of hemoglobin and ferritin is lesser in orally consumed iron without much of statistical differences in intravenous iron. Nonetheless, high doses of orally consumed iron result in statistically significant increase.

CONCLUSION

We have concluded from our analysis that the levels of hemoglobin and serum ferritin significantly increase by utilizing intravenous iron sucrose therapy, more rapidly than consuming oral ferrous sulphate. There was a stark contrast between the levels of iron in women treated with intravenous iron sucrose therapy and those given oral iron, even there was a visible difference in the 40th day of postpartum. During the whole period of analysis, we observed that the ferritin levels rise swiftly in women treated with intravenous iron than those administered oral iron.

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