

Comparison of Oral Daily and Alternate Iron Regimen in Iron Deficiency Anemia: A Randomized Controlled Intervention

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Abstract: ***Introduction:** This study was conducted to determine the difference in change in reticulocyte count and hemoglobin after 28 days of daily and alternate iron therapy. **Methodology:** This hospital based randomized controlled trial was conducted for the study period of one year. Thirty patients in each arm were recruited. Their characteristics were reported at baseline and after 28 days of therapy. Analysis was done using Microsoft excel 2029. **Results:** There was significant improvement in both hemoglobin and reticulocyte count after iron therapy in both study arms from baseline (p value < 0.05). although improvement in alternate regimen was higher in alternate therapy compared to daily therapy. **Conclusion:** Alternate iron therapy showed more improvement compared to daily iron therapy.*

Keywords: Alternate iron therapy, Daily iron therapy, Haemoglobin, Reticulocyte count.

1. Introduction

Globally iron deficiency anemia is the most frequent cause of anemia. Thirty to fifty percent cases of anemia in children and other age groups occurs due to iron deficiency. In the diet, iron is present in red meat, eggs, vegetables, and grains. Absorption of iron in our body mainly affected by iron store and balance in the body. Special proteins such as ferritin and transferrin aid in the absorption, distribution and storage of iron. The most easily absorbable form of iron is heme iron which is derived from hemoglobin and myoglobin of animal food sources (meat, seafood, poultry) (15% to 35%) and contributes to 10% or more of our total absorbed iron. Based on intake data and isotope studies, bioavailability of iron bioavailability usually in the range of 14–18% for mixed diets and 5–12% for vegetarian diets in cases with no iron stores.

There are some serious consequences of iron deficiency which can range from reduced work capacity, impaired cognitive function, impaired mental and motor development, and decreased growth rate. Reticulocyte are immature erythrocyte, they have a very short life span. Some author like Sudhir Mehta et al found that intermittent oral iron therapy was better than daily oral iron therapy. Hence, this study was planned with the objective to find out the difference in improvement in hemoglobin and reticulocyte count from baseline to 28 days after therapy between both study arms.

2. Materials and Methods

Study type: A Hospital based randomized interventional study

Study area: Department of pediatrics, SPMCHI, SMS medical college and Hospital, Jaipur.

Study duration: One year

Study population: 30 patients in each study arm were randomized using block randomization method.

Inclusion criteria:

- Patients above 6 months and below 18 years of age.
- All children with newly & untreated mild to moderate iron deficiency state.
- Children whom parents gave informed consent.

Exclusion criteria:

- Patients with anemia other than iron deficiency anemia.
- Blood transfusion in last three months.

3. Methodology

- All anemic patients were subjected to detailed history and clinical examination was conducted, and investigations like complete blood count and reticulocyte indices were done.
- All patients were randomized into two groups, in first group iron supplement (3mg/kg) were administered in empty stomach alternate day and in second group iron

supplement (3mg/kg) were administered in empty stomach.

- Patients were followed up to four weeks, CBC and reticulocyte indices were done.

Data analysis

Data was entered in excel spreadsheet. Discrete data was summarized into proportions and were analyzed using chi square or fisher exact test. Continuous data was summarized into mean and standard deviation and were analyzed using student t test. Significance level was kept at 95%.

4. Results

Table 1: Sociodemographic profile of patients

Variables	Daily therapy (n=30)	Alternate therapy (n=30)	Test of significance
Age (Years)	3.38±1.42	3.8±1.73	t=1.018, Df=58, p value=0.313
Sex	Male	16 (53.3)	X ² =4.800, Df=1, p value=0.028
	Female	14 (46.7)	

Mean age of cases in daily therapy group was 3.38±1.42 years and in alternate therapy group was 3.8±1.73 years, and there was no significant difference in mean age between both the study groups (p value<0.05)

Proportion of male children in daily therapy group was significantly higher in daily therapy group than alternate therapy group (p value<0.05)

Table 2: Hemoglobin and Reticulocyte count at baseline in both groups

Variable at baseline	Daily therapy (n=30)	Alternate therapy (n=30)	Test of significance
Haemoglobin	8.62±0.70	8.60±0.61	t=0.098, Df=58, p value=0.922
Reticulocyte count	0.24±0.26	0.25±0.26	t=0.159, Df=58, p value=0.874

In our study there was no statistically significant difference in mean Hemoglobin and reticulocyte count at baseline between both study groups (p value<0.05)

Table 3 - Hemoglobin and Reticulocyte count after 4 weeks in both groups

Variable after 4 weeks	Daily	Alternate	Test of significance
Haemoglobin	9.47±0.64	9.40±0.60	t=0.417, Df=58, p value=0.679
Reticulocyte count	0.74±0.33	0.82±0.42	t=0.829, Df=58, p value=0.410

There was significant improvement in both hemoglobin and reticulocyte count in both study arms from baseline to after 4 weeks of therapy using paired t test (p value<0.05). While there was no statistically significant difference in hemoglobin and reticulocyte count between both study arms (p value > 0.05)

5. Discussion

This prospective, randomized, interventional study was conducted at S. M. S medical college and Hospital, Jaipur

over the period of one year to evaluate the effect of oral iron therapy (daily vis - a - vis alternate day) on hemoglobin and reticulocyte count.

In the present study, oral iron therapy (3 mg/kg elemental iron in each arm) was given to patients of iron deficiency state on alternate day and daily and all patients were followed up to 28 days.

In our study mean change in Hb value from base line was statistically significant in both the groups. Though the mean change was higher in alternate day therapy group compared to daily therapy group but the difference was statistically not significant (p value>0.05)

Ahmad M. Faqih et al⁸ also observed that the twice - weekly dose was as effective as daily iron dose in children in term of increase in hemoglobin after 3 months of iron treatment.

In our study mean increase in reticulocyte % on day 28 from baseline was statistically significant in both the groups (p value<0.05). Mean change was also higher in alternate day therapy group compared to daily therapy group. Rahul kaundal et al⁹ observed that increase in reticulocyte count was more in twice daily therapy group compared to alternate day therapy group (p value=0.09)

6. Conclusion

We can conclude that alternate day iron therapy improved gut iron absorption leading to better increment in reticulocyte count and hemoglobin. Small sample size and being unicentric study was the major limitation in this study.

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