https://doi.org/10.48047/AFJBS.6.8.2024.2783-2790

African Journal of Biological Sciences

Research Paper Open Access

EFFICACY OF ORAL IRON SUPPLEMENTATION DAILY VERSUS ALTERNATIVE DAY ADMINISTRATION AND ITS OUTCOME IN PREGNANT WOMEN

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Article History

Volume 6, Issue 8, 2024

Received: 09 May 2024

Accepted: 10 Jun 2024

doi: 10.48047/AFJBS.6.8.2024.2783-2790

ABSTRACT:

Background: Inspite of extensive preventive programs, in India iron-deficiency anemia during pregnancy is the most common type of anemia. This results in adverse pregnancy outcomes for both mother and newborn. The present study is done on 200 antenatal women to observe the outcome of daily versus alternate day iron supplementation during pregnancy. The results revealed that the present iron supplementation dose may not be suitable for all the pregnant women. For non-anemic women small doses may be sufficient to avoid unwanted side effects of iron supplementation.

Aim: To study the efficacy of oral iron daily versus alternative day admission and its outcome during pregnancy.

Methodology:

A randomized clinical trial was done on 200 antenatal women attending OPD of department of Obstetrics and Gynecology, Vinayaka, Missions Medical College, Karaikal. All healthy antenatal mothers coming to antenatal OPD in VMMC&H Karaikal were included in the study. ANTENATAL Mothers with Preexisting anemia, history of chronic illness (DM, HTN, bronchial asthma, epilepsy, cardiac diseases etc.), history of menorrhagia, history of chronic peptic ulcer(hemorrhagic), history of beta thalassemia and other hemoglobinopathy, multiple pregnancy, any allergy to iron were excluded from the study. Randomization into 2 groups (40 each) was done. Baseline hemogram and ferritin were done for every subject. Investigations are repeated at 28 weeks and 36 weeks.

Pregnancy outcome measure-mean birth weight and mode of delivery were compared in between the groups.

CONCLUSION: Our study concluded that alternate day iron supplementation in low-risk anemic pregnant women can be done. The present iron supplementation dose may not be suitable for all the pregnant women. For non-anemic women small doses may be sufficient to avoid unwanted side effects of iron supplementation. Patient compliance can also be increased if side effects are avoided.

KEYWORDS: antenatal women, iron supplementation, anemia, birth weight

INTRODUCTION: Healthy Mothers and Children's are the real wealth of Societies

Inspite of extensive preventive programs, in India iron-deficiency anemia during pregnancy is the most common type of anemia. This results in adverse pregnancy outcomes for both mother and newborn[1-4]. Various studies suggest that iron absorption can be maximum when iron supplements were administered intermittently, matched with mucosal regeneration time of the intestine, as a result the side-effects are minimized and enhances compliance rates[1, 6]. Iron interacts with other micronutrients like zinc. There also exists a relation between high-dose iron intake and pregnancy complications such as gestational diabetes, preterm labour and low birth weight, suggest that the amount of iron recommended in the current protocol is too high[3,7–10]

Numerous researchers propose that weekly iron supplementation is a reasonable alternative to daily supplementation in terms of hematological indices as well as side-effects[2,6,10,11]. There exists uncertainty regarding the effectiveness of iron supplementation by lowering the dosage has not been solved yet[1,12]. Although routine daily iron supplementation from the 4th month of pregnancy is a standard part of prenatal care, iron deficiency anemia is still a commonly reported complication of pregnancy[13]. Therefore, our study is to observe the outcome of daily versus alternate day iron supplementation during pregnancy.

AIM:

To study the efficacy of oral iron daily versus alternative day admission and its outcome during pregnancy.

OBJECTIVE:

PRIMARY OBJECTIVE:

To compare oral iron supplementation in two regimens daily versus alternative day therapy in preventing anemia in healthy pregnant women.

SECONDARY OBJECTIVE

To compare the overall pregnancy outcome with respect to changes in the hemoglobin level side effects and compliance of the pregnant women with daily versus intermittent iron supplementation.

MATERIALS AND METHODS:

A randomized clinical trial was done on 200 antenatal women attending OPD of department of Obstetrics and Gynecology, Vinayaka, Missions Medical College, Karaikal. All healthy antenatal mothers coming to antenatal OPD in VMMC&H Karaikal were included in the study. ANTENATAL Mothers with Preexisting anemia, history of chronic illness (DM, HTN, bronchial asthma, epilepsy, cardiac diseases etc.), history of menorrhagia, history of chronic peptic ulcer(hemorrhagic), history of beta thalassemia and other hemoglobinopathy, multiple pregnancy, any allergy to iron were excluded from the study. Randomization into 2 groups (40 each) was done. Baseline hemogram and ferritin were done for every subject. Investigations are repeated at 28 weeks and 36 weeks.

Pregnancy outcome measure-mean birth weight and mode of delivery were compared in between the groups.

RESULTS:

GRAPH-1 MEAN AGE DISTRIBUTION IN GROUPS

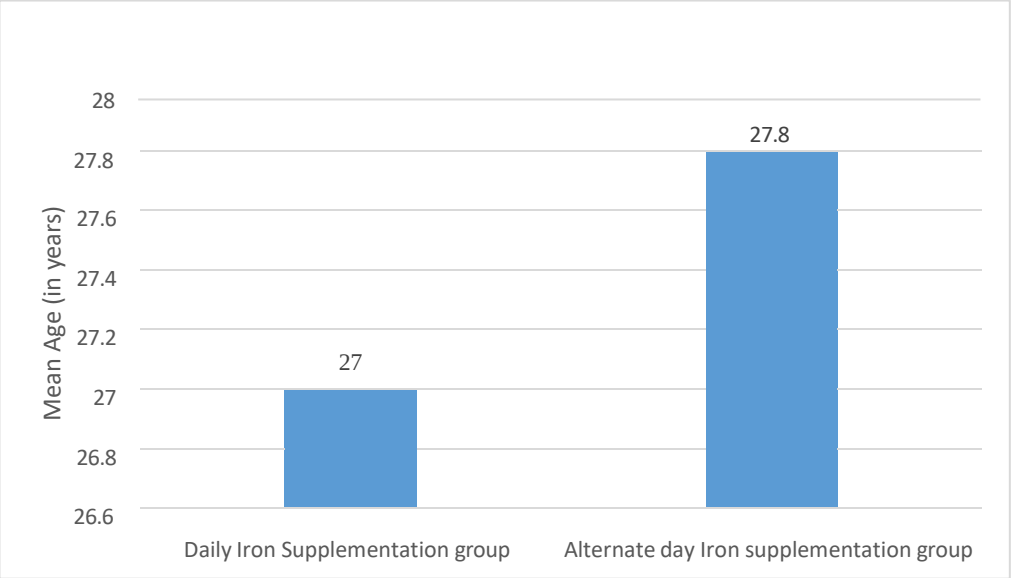
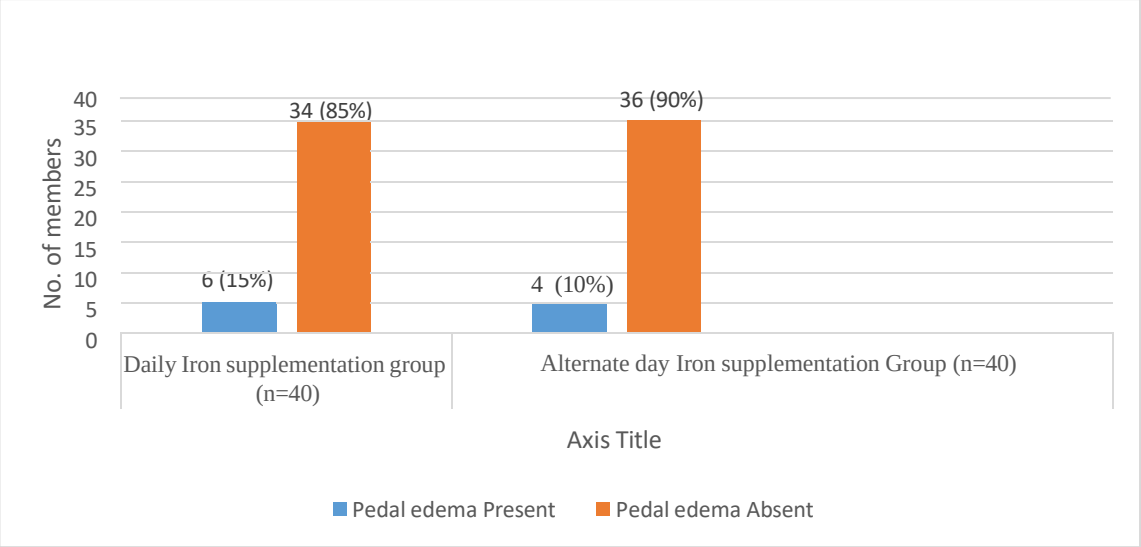


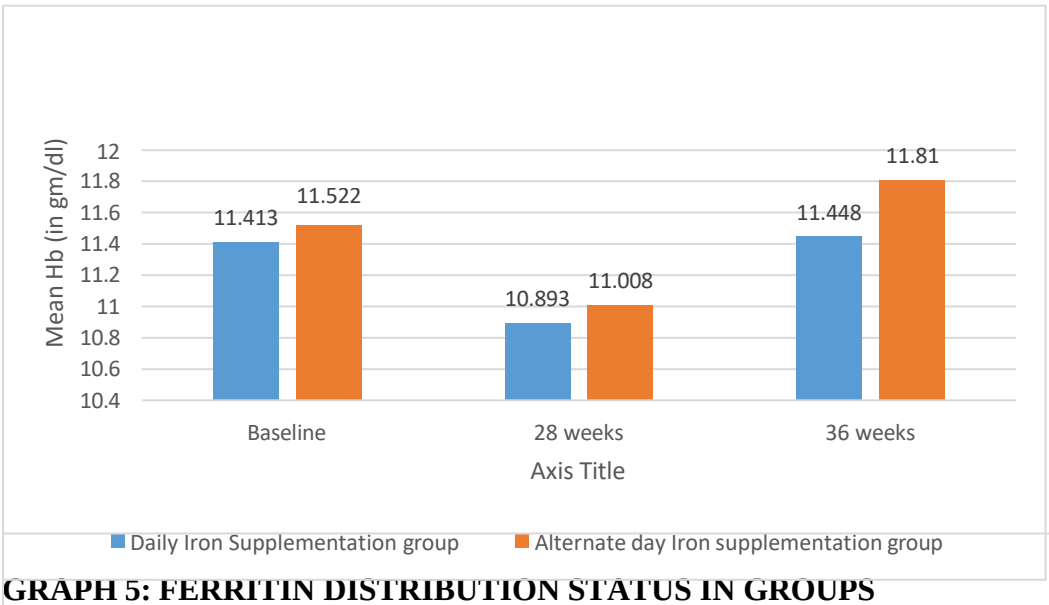
TABLE 1: OBSTETRIC HISTORY IN GROUPS

Gravida status	Daily Iron supplementation group (n=40)		Alternate day Iron supplementation Group (n=40)		P-Value
	Number	Percentage	Number	Percentage	
Primigravida	22	55%	17	42.5%	
Gravida 2	8	20%	14	35%	0.451 (CHI SQUARE TEST)
Gravida 3	8	20%	7	17.5%	
Gravida 4	2	5%	1	2.5%	
Gravida 5	0	0	1	2.5%	

GRAPH 3: PEDAL EDEMA DISTRIBUTION IN GROUPS



GRAPH 4: HAEMOGLOBIN STATUS IN GROUPS AT VARIOUS TIME INTERVALS



GRAPH 5: FERRITIN DISTRIBUTION STATUS IN GROUPS

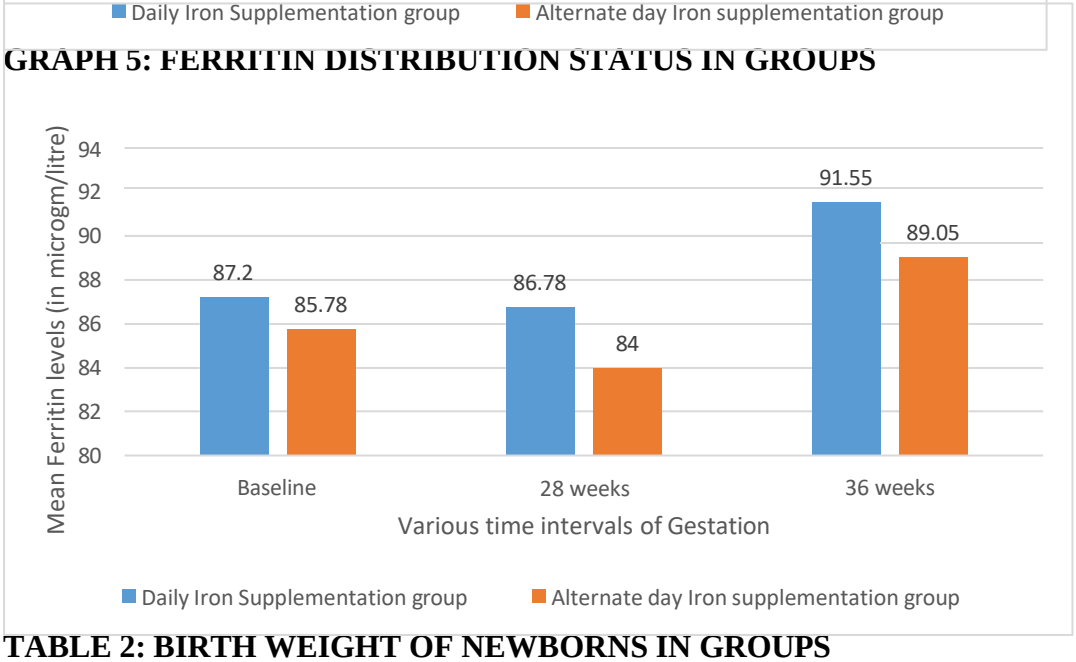


TABLE 2: BIRTH WEIGHT OF NEWBORNS IN GROUPS

Birth weight of Newborns	Daily Iron supplementation group		Alternate day Iron supplementation Group		P-Value
	Mean	Standard Deviation	Mean	Standard Deviation	
Birth Weight (in Kgs)	2.8198	0.355751	2.69943	0.459996	0.194

TABLE 3: PAIRED DIFFERENCE OF HAEMOGLOBIN STATUS IN GROUPS AT VARIOUS TIME INTERVALS

Paired difference of Hb status in between	Daily Iron supplementation group		Alternate day Iron supplementation Group		P-Value
	Mean difference	Standard error Mean	Mean difference	Standard error Mean	
Baseline - 28 weeks	0.52	0.3963	0.5150	0.0510	0.197
28 weeks -36 weeks	-0.5550	0.2900	-0.8025	0.0978	0.063
Baseline-36 weeks	-0.0350	0.2958	-0.2875	0.1100	0.906

TABLE 4: PAIRED DIFFERENCE OF FERRITIN STATUS IN GROUPS AT VARIOUS TIME INTERVALS

Paired difference of Ferritin status in between	Daily Iron supplementation group		Alternate day Iron supplementation Group		P-Value
	Mean difference	Standard error Mean	Mean difference	Standard error Mean	
Baseline - 28 weeks	0.425	0.805	1.775	0.680	0.087
28 weeks -36 weeks	-4.775	1.11	-5.05	1.161	<0.01
Baseline-36 weeks	-4.350	1.172	-3.275	0.827	<0.01

DISCUSSION:

In our study 200 subjects are recruited initially, but out of which 10 patients dropped out of study due to the side effects of iron supplementation, 25 patients dropped out of study due to complications of iron supplementation,40 patients were dropped out of study before 28 weeks of gestation and about 45 patients dropped out of study before 36 weeks of weeks of gestation. The mean age of subjects in daily iron supplementation group was observed to be 27 years and the mean age of subjects in alternate day iron supplementation group was 27.80 years'-Value is 0.379(>0.05) so statistically insignificant.

In daily iron supplementation group 22 are prim gravida accounting for 55%, 8 are gravida 2 accounting for 20% ,8 subjects are gravida 3 accounting for 20% and the remain 2 are gravida 4 account for 5% of study population of the group. In alternate day iron supplementation group 17 are primi gravida accounting for 42.5% ,14 are gravida 2 accounting for 35% ,7 subjects are gravida 3 accounting for 17.5% 1is gravida 4 accounting for 2.5%, and the remaining 1 is gravida 5 accounting for 2.5% of study population of the group's. P-value by Chi-Square test for obstetrics history in between daily iron supplementation group and alternate day iron supplementation group is 0.451 (>0.05), which is statistically insignificant. In daily iron supplementation group about 15% of subjects has developed pedal edema, whereas in alternate day iron supplementation group 10% of subjects developed pedal edema.

The mean baseline hemoglobin status in daily iron supplementation group is 11.413 gm/dl and in alternate day iron supplementation group is 11.522 gm/dl.P-Value is 0.735(>0.05), statistically insignificant. The mean hemoglobin status at 28 weeks is 10.893 gm/dl in daily iron supplementation group and in alternate day iron supplementation group is 11.008 gm/dl. p-Value is 0.683 (>0.05), statistically insignificant. The mean hemoglobin status at 36 weeks is 11.413 gm/dl in daily iron supplementation group and in alternate day iron supplementation group is 11.810gm/dl. p-Value is 0.004 (<0.05), statistically significant. The mean baseline ferritin levels in daily iron supplementation group is 87.20 micrograms/l and in alternate day iron supplementation group is 85.78 microgram/l.P-Value is 0.834(>0.05), statistically insignificant.

The mean ferritin levels at 28 weeks is 86.78 micrograms/l in daily iron supplementation group and in alternate day iron supplementation group is 84.00 micrograms/l.p-Value is 0.686(>0.05), statistically insignificant. The mean ferritin levels at 36 weeks is 91.55 microgram/lit in daily iron supplementation group and in alternate day iron supplementation group is 89.05 microgram/lit.p-Value is 0.686(>0.05), statistically insignificant.

The mean birthweight of babies of daily iron supplementation group is 2.81 kg and the mean birth weight of babies of alternate day iron supplementation group is 2.69 kg. p-value of birthweight on between babies of both the groups is 0.194(>0.05), which is statistically insignificant[16]. The paired mean difference of hemoglobin status in between baseline and 28 weeks in daily iron supplementation group is 0.52 and the paired mean difference of hemoglobin status in between baseline and 28 weeks in alternate day iron supplementation group is0.515, p-value is 0.197(>0.05) which is statistically insignificant.

In a study by J A Adaji on daily versus twice daily dose of ferrous sulphate supplementation in pregnant women observed that once daily 65 mg elemental iron sulphate is as effective as twice daily dose regimen[17]. The findings of this study is similar to the findings of my study where there is no significant difference in hemoglobin levels between subjects who took daily iron supplementation and alternate day iron supplementation

The paired mean difference of hemoglobin status in between 28 weeks and 36 weeks in daily

iron supplementation group is -0.550 and the paired mean difference of hemoglobin status in between 28 weeks and 36 weeks in alternate day iron supplementation group is - 0.802, p-value is 0.063(>0.05) which is statistically insignificant. The paired mean difference of hemoglobin status in between baseline and 36 weeks in daily iron supplementation group is -0.035 and the paired mean difference of hemoglobin status in between baseline and 36 weeks in alternate day iron supplementation group is -0.287, p-value is 0.906(>0.05) which is statistically insignificant.

In a randomized clinical trial by A.Goshtasebi and M.Alizadeh on impact of taking daily iron supplementation and twice weekly iron supplementation on maternal and fetal hemoglobin observed that there is no significant differences in initial and delivery hemoglobin levels in between 2 groups and the birth weight is significantly higher in daily supplemented group[14].These findings are in partial agreement with my study that in our study also there is no significant variation in hemoglobin levels between base and at 36 weeks in both the groups, but in our study there is no significant variation in mean birthweight of babies in between the groups which is in contrary to their study[15].

The paired mean difference of ferritin status in between baseline and 28 weeks in daily iron supplementation group is 0.42 and the paired mean difference of ferritin in between baseline and 28 weeks in alternate day iron supplementation group is1.775, p-value is 0.087(>0.05) which is statistically insignificant. The paired mean difference of ferritin status in between 28 weeks and 36 weeks in daily iron supplementation group is -4.775 and the paired mean difference of hemoglobin status in between 28 weeks and 36 weeks in alternate day iron supplementation group is -5.05, p-value is <0.01which is statistically significant. The paired mean difference of ferritin status in between baseline and 36 weeks in daily iron supplementation group is -4.775 and the paired mean difference of ferritin status in between baseline and 36 weeks in alternate day iron supplementation group is - 3.275, p-value is <0.01 which is statistically significant.

CONCLUSION: Our study concluded that alternate day iron supplementation in low-risk anemic pregnant women can be done. The present iron supplementation dose may not be suitable for all the pregnant women. For non-anemic women small doses may be sufficient to avoid unwanted side effects of iron supplementation. Patient compliance can also be increased if side effects are avoided**.**

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