Research Article

Effectiveness of Daily vs Weekly Iron Folic Acid Tablet Supplements Among Adolescent Girls: A Meta-Analysis

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ABSTRACT:

Background-Anemia is a condition where there is reduction of red platelets (RBCS) or hemoglobin in the blood. This leads to a down regulation of oxygen carrying capacity of blood. On gradual progression of the disease, the manifestations are regularly obscure and may incorporate feeling tired, shortness of breath or a poor capacity to exercise. We carried out a meta-analysis. The aim of the present study was to assess the effectiveness of daily verses weekly iron folic acid tablet supplements among adolescent girls.

Materials & Methods-We searched articles/ studies in online search engines such as Pubmed, Medline, Embase, DELNET, CINAHL, Citation Index, Cohort Library, Cochrane Central, Gray literature. We used keywords such as anemia, iron deficiency anemia, folic acid. The search yielded 69 articles. Seven randomized control studies were included for the meta-analysis according to the inclusion criteria.

Results-Fixed effect model was used to analyze the effectiveness of daily versus weekly iron folic acid tablet supplementation. The present analysis showed an I^2 value of 99.838 signifying varied heterogeneity among the studies. The model showed significant important (p<0.0001) in hemoglobin level after daily iron folic acid tablet supplementation. The findings of the analysis revealed that out of seven studies, five studies favored daily iron folic acid tablet supplementation whereas only two studies were in favor of weekly iron folic acid tablet supplementation.

Conclusion: The present meta-analysis supports daily iron folic acid tablet supplementation as compared to weekly iron folic acid tablet supplement among adolescent girls.

KEYWORDS: anemia, iron deficiency anemia, folic acid

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INTRODUCTION:

Anemia is a condition where there is reduction of red platelets (RBCS) or hemoglobin in the blood. This leads to a down regulation of oxygen carrying capacity of blood. On gradual progression of the disease, the manifestations are regularly obscure and may incorporate feeling tired, shortness of breath or a poor capacity to exercise. On the other hand, the condition may show severe manifestations such as perplexity, loss of cognizance, or excessive thirst[1]. Iron is of great importance in human nutrition. Iron deficiency anemia is wide spread in the world[2]. About 1.62 billion people are globally affected[3]. Prevalence of anemia amongst women of reproductive age (15-49) was 51.40% as of 2016 in India. National Family Health Survey (NFHS) shows Madhya Pradesh registered 56 % anemia in reproductive age, which is 0.7% higher than national average. Almost 46.9% urban and 59.6% rural women population in state are

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Study name	Subgroup within study	Difference in means	Standard error	Variance	Lower limit	Upper limit	Z-Value	p-Value	pre	post
Dr Mohapatra	Daily	-2.240	0.040	0.002	-2.318	-2.162	-56.264	0.000	20	20
Dr Mohapatra	Weekly	-2.090	0.027	0.001	-2.143	-2.037	-76.830	0.000	20	20
Imelda Angeles Agdeppa	Daily	-0.300	0.015	0.000	-0.330	-0.270	-19.662	0.000	64	64
Imelda Angeles Agdeppa	Weekly	-0.400	0.015	0.000	-0.430	-0.370	-26.215	0.000	64	64
Raghvendra Gumasta	Daily	-1.100	0.192	0.037	-1.476	-0.724	-5.732	0.000	60	60
Raghvendra Gumasta	Weekly	-1.000	0.183	0.034	-1.360	-0.640	-5.450	0.000	60	60
Sarla Prem Kumar	Daily	-1.230	0.182	0.033	-1.587	-0.873	-6.761	0.000	49	49
Sarla Prem Kumar	Weekly	-1.000	0.118	0.014	-1.230	-0.770	-8.507	0.000	56	56
Aditi Sen	Daily	-1.880	0.317	0.101	-2.502	-1.258	-5.923	0.000	34	34
Aditi Sen	Weekly	-1.000	0.098	0.010	-1.193	-0.807	-10.164	0.000	46	46
Renuka Jayatissa	Daily	-0.300	0.100	0.010	-0.496	-0.104	-3.007	0.003	222	222
Renuka Jayatissa	Weekly	-0.300	0.111	0.012	-0.517	-0.083	-2.713	0.007	220	220
Dr Narendra Kumar Sharma	Daily	-2.220	0.035	0.001	-2.289	-2.151	-62.741	0.000	25	25
Dr Narendra Kumar Sharma	Weekly	-2.110	0.040	0.002	-2.188	-2.032	-53.150	0.000	25	25
		-0.859	0.009	0.000	-0.876	-0.841	-95.871	0.000		

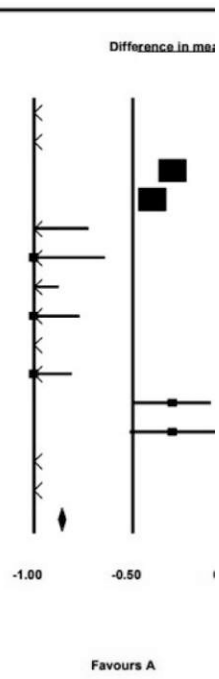

Table 1: Various studies showing weekly vs daily iron folic acid tablet supplementation on adolescent woman.

affected by anemia[4]**.** Latest national level health survey has brought out a shocking fact. According to the survey, 80 % population in Madhya Pradesh, Uttar Pradesh, Rajasthan, Bihar were anemic. According to a study on anemia in adolescent school girls of Bhopal, prevalence was 58.4%. Poor dietary habits, blood loss in menstrual cycle, less consumption of iron rich source (green leafy vegetables and non-vegetarian diet) commonly cause iron deficiency anemia among adolescents. Thus, iron deficiency anemia can be prevented by providing adequate amount of iron supplements to the adolescent girls[5]**.**Various government programs have been carried out to tackle this serious issue. The main aim of such programs is to decrease severity and prevalence of anemia in adolescents. Weekly Iron –Folic Acid Supplements of 100mg elemental iron and 500ug folic acid on a decided day are most commonly prescribed[6]. The present met-analysis was done to find out the whether daily dose or weekly dose is effective.

MATERIALS & METHODS:

The study was carried out in our institute and it had the necessary institutional ethical committee approval. Randomized Clinical Trials (RCTs) or controlled trials in adolescent girls comparing the effectiveness of daily versus weekly iron folic acid tablet supplements were chosen for the meta-analysis. The search was done from online search engines such as Pubmed, Medline, Embase, DELNET, CINAHL, Citation Index, Cohort Library, Cochrane Central, Gray literature, published and unpublished manuscript sources and hand – searched journals from 1997 to 2019. Total 69 recorded through online database searching and 20 additional records through other sources were found. Only studies involving adolescent girls who were given iron-folic acid tablets on weekly versus daily basis were considered. Studies conducted on pregnant women, postnatal mothers, children and adolescent boys were excluded.

On the basis of our inclusion criteria only 7 studies qualified for the meta-analysis. The fixed effects model was used for analysis. Heterogeneity was determined using the I^2 statistic, in which numbers greater than 75% were suggestive of considerable heterogeneity and by *p*-value from the X^2 test. In cases of considerable heterogeneity, no pooled – effect estimates was provided.

RESULTS:

The meta-analysis is one of its kind that considered only adolescent women being treated with iron-folic acid tablets either daily or weekly. The meta-analysis done by the fixed effects model showed that out of 7 studies, 5 studies favored the daily iron folic acid tablet supplementation in comparison with only 2 studies that favored weekly iron folic acid tablet supplementation (Table 1). Hence, we can say that daily Iron folic acid tablet supplements are more effective for improving hemoglobin level among adolescent girls than weekly doses.

DISCUSSION:

UNICEF recommends iron folic acid tablet supplementation for all female between 10-49 years in countries where over 30% of the population is anemic[7]. While this would put additional financial burden on the government, the benefits in future would far outweigh the expenditure incurred. Studies by Liu, et al.[8] and Gross[9] have suggested that a supplement given weekly twice or even once would be as effective as a daily supplement in raising hemoglobin levels. In such a case the cost of supplementation would also be cut to one third. However, our meta-analysis study showed that most of the studies conducted revealed that daily supplements are better.

We found out that supplementation with iron either daily or weekly twice brought about a significant increase in the hemoglobin levels of the subjects to some extent. and there was no significant difference between the increase brought about by both types of supplementations. At the end of 84 days of supplementation, the hemoglobin status of weekly twice-supplemented subjects was as good as daily supplemented subjects. As seen from the data, even for shorter periods of time this improvement holds good. When the total mean increment in hemoglobin was examined, the severely anemic subjects showed better results. It is observed that lower the initial hemoglobin level, the greater the need for increase on supplementation. It is a fact that the body dictates the amount of iron to be absorbed depending on its own iron status. Although our study was strictly on adolescent girls, similar studies need to be done on pregnant women, postnatal mothers, children and adolescent boys.

CONCLUSION:

Assessment of the effectiveness of weekly iron folic acid tablet supplement among adolescent girls is the main concept of the study. We concluded that there was minimal difference between daily and weekly iron folic acid tablet supplement.

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Conflicts of interest
There are no conflicts of interest.

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