



RESEARCH ARTICLE

STUDY ON EFFICACY OF DIFFERENT DOSAGE REGIMENS OF IRON PROPHYLAXIS AMONG ADOLESCENTS IN RURAL AREA

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ABSTRACT

Aims and Objective: To compare the efficacy of different dosage regimens of iron prophylaxis among the subgroups of boys and girls. A quasi experimental study was conducted in rural health centre area of Department of community medicine, RMMC&H. Hundred and one anemic adolescents were identified, out of which only 93 participated till the end of the study. 93 The Individuals were graded mild (10-11.9gms/dl), moderate (8-9.99%) and severely anemic (8gms/dl) as per WHO [5] and they were divided into two groups. 43 individuals in category A (15 boys & 28 girls) were given once weekly supplementation by the health worker under supervision. Category B consisting of 50 subjects (15 boys & 35 girls) were given twice weekly supplementation. Supplementation was given for a period of 6 months under supervision. Hemoglobin estimation was done at the end of 6 months to find out the efficacy of 2 different regimens.

Results: There was a significant increase in the mean hemoglobin level in both the category A [mean hemoglobin level 10.42 & 10.66 in boys and girls have increased to 14.06 & 13.10 respectively] & category B [mean hemoglobin level 11.02 & 10.26 in boys and girls have increased to 13.50 & 12.38 respectively] and there was marginal increase in category A when compared to category B, among both boys and girls. It was observed that, with once weekly regimen as compared to twice weekly schedule, the increase in mean hemoglobin was better in boys as compared to girls.

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INTRODUCTION

Anemia afflicts an estimated two billion people worldwide; it is a serious health issue for women and young children. Prevalence of anemia is disproportionately high in developing countries, due to poverty, inadequate diet, certain diseases, pregnancy and lactation, and poor access to health services(1). Anemia is ignored in most developing countries even though it is one of the most prevalent public health problems and has serious consequences for national development. In India, 74 % of children and over 50% of adolescent girls and women of reproductive age are anemic. National anemia surveys conducted in 25 developing countries and World Health Organization [WHO] estimate that more than 2 billion people worldwide are anemic. A severe public health problem exists when anemia prevalence is more than 40% in any age group (2). Anemia is a critical health concern because it affects growth and energy levels. In pregnancy it is associated with premature births, low birth weight and perinatal and maternal mortality (3). Very few community based studies are available

on the prevalence of anemia and on trials to compare the efficacy of different treatment regimens in rural areas. Hence, the study is planned in this direction

MATERIALS AND METHODS

Pitchavaram, a village in Cuddalore district in Tamilnadu which is a field practice area and rural health centre for RMMC&H under the division of community medicine is the study area. Before the intervention study was carried out, a cross section study was done in 4 hamlets of the rural health centre area to identify the adolescents in the area. In a study done by Tripathi S. et al, in Lucknow(4) has reported prevalence of anemia among adolescents was 53.6%. The sample size in the present study was 355, calculated with the above prevalence and allowable error as 10% by using the formula $4pq/l^2$. The adopted sample size of the present study is 376 to overcome the dropouts and to increase the coverage of adolescent girls. 367 adolescents were identified from 4 hamlets, out of which 205 (55.9%) was found to be anemic by measuring their Hb level using cyanmethemoglobin method of Daice and Lewis (5).

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The present study was a quasi experimental study. Anemic adolescents were identified in 4 hamlets (205). Out of the 4 hamlets we have randomly selected 2 hamlets for the intervention. Hundred and one anemic adolescents were selected and divided into two groups as category A and category B. Category A consists of 47 subjects from South Pitchavaram who were given once weekly supplementation. Category B consists of 54 subjects from Kanagarapettai who were given twice weekly supplementation. The supplementation consists of 100 mg of ferrous sulphate and 500microgram folic acid for a period of six months under supervision of a health worker. Periodic monitoring was done to find out whether supplementation was regular by the health worker, side effects if any and any other parallel iron supplementation which is easy to assess [supplementation at schools]. Out of 101 anemic individuals only 93 [category A – 43; with 15 boys & 28 girls, and category B – 50; with 15 boys & 35 girls] participated till the end of the study (table I). Two dropped from the study, two stopped taking tablets due to side effects and four not willing for hemoglobin estimation at the end. Hemoglobin estimation was done at the end of 6 months to find out the efficacy of two different regimens by using the same cyanmethemoglobin method & technician. The study was carried out for a period of 9 months from August 2006 – May 2007. Data were collected; statistical analysis was done using descriptive statistics, chi square test and ANCOVA.

compared to category B, in both boys and girls which is statistically significant (P value = 0.001) as shown in table II. The increase in mean Hb is better in boys as compared to girls and this may be due to menstrual blood loss in some proportion of girls. The increase in mean Hb level is more (3.63) in moderately anemic individuals as compared to mildly (2.24) anemic individuals as shown in table IV; because iron absorption is directly related to severity of anemia. Two way analysis of covariance method has been applied to compare the effectiveness of intervention and the interaction effect between the gender and intervention. The increase in the Hb level in males is more when compared to females in both the groups. It is also observed that there is no significant relationship between gender and intervention (table III).

DISCUSSION

It is inferred that, once weekly regimen is as effective as twice weekly and proved to be marginally better. Similarly Imran, et al (6) in their study reported that once weekly iron supplementation is as effective as daily supplementation. In a randomized control trial by Binay Kumar Shah [2002] (7), observed that prevalence of anemia declined from 68.6% and 70.1% in groups with weekly and daily supplementation of iron respectively for 14 weeks. There was a significant rise in the mean hematocrit of both supplemented groups.

Table 1: Distribution of anemic individuals according to Sex and Category

Sex	Category A	Category B	Total
Boys	15 (35%)	15 (30%)	30 (32%)
Girls	28 (65%)	35 (70%)	63 (68%)
Total	43 (100%)	50 (100%)	93 (100%)

Table 2: Distribution of mean change in the Hb level before and after intervention according to sex

Hb level	Male				Female			
	Category A		Category B		Category A		Category B	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Before intervention	10.42	1.31	11.02	0.52	10.66	0.90	10.26	0.81
After intervention	14.06	1.36	13.50	1.28	13.10	1.10	12.38	.80
Mean change	3.63	1.99	2.48	1.37	2.44	1.22	2.11	0.78

P value = 0.007

Table 3. Analysis of Covariance

Variable	F Value	P Value
Intervention	7.746	.007
Gender	16.735	.001
Intervention Vs Gender	.016	.910

Table 4. Distribution of mean hemoglobin change after intervention in different grades of anemia

Grades	Category A		Category B	
	Number	Mean Change	Number	Mean Change
Mild (75)	31	2.36	44	2.16
Moderate (18)	12	3.13	6	2.63

RESULTS

There is a significant increase in the mean hemoglobin level in both the category A – once weekly (mean Hb level of 10.42 & 10.66 in boys and girls respectively increased to 14.06 & 13.10). In category B – twice weekly (mean Hb level of 11.02 & 10.26 in boys and girls respectively increased to 13.50 & 12.38). The increase in category A is marginally higher when

compared to category B, in both boys and girls which is statistically significant (P value = 0.001) as shown in table II. The increase in mean Hb is better in boys as compared to girls and this may be due to menstrual blood loss in some proportion of girls. The increase in mean Hb level is more (3.63) in moderately anemic individuals as compared to mildly (2.24) anemic individuals as shown in table IV; because iron absorption is directly related to severity of anemia. Two way analysis of covariance method has been applied to compare the effectiveness of intervention and the interaction effect between the gender and intervention. The increase in the Hb level in males is more when compared to females in both the groups. It is also observed that there is no significant relationship between gender and intervention (table III).

prophylactic dosage. At any time once weekly regimen is more convenient and easy to administer and cost effective.

Summary

Intervention shows the increase in mean Hb level in category A (once weekly) is as good as category B (twice weekly) and there is a marginal increase in boys when compared to girls. The increase in Hb is more in moderately anemic individuals, than that of mildly anemic individuals. Since the sample size for intervention study is small, the validity of the results has to be checked by conducting the intervention on a large sample size. In this study there was no absolute control over other sources of iron consumed and it is assumed that both the group had similar consumption of iron from dietary and other sources. But care was exercised to check at least the supplementation at the schools till the study was completed.

Conclusion

In this study once weekly regimen of iron is proved to be as effective as twice weekly regimen. This can be suggested to any program for mass iron prophylaxis among adolescents and it will have effect on the management of mild cases of anemia also as demonstrated by the study.

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