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Effectiveness of Weekly Iron and Folic Acid Supplementation Programme to Control Anemia among Rural Adolescent School Girls of Davangere, Karnataka

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ABSTRACT

Introduction: Adolescent anaemia is a critical public health problem in India. The ministry of Health and Family Welfare, government of India has launched the weekly Iron and Folic acid Supplementation (WIFS) Programme to reduce the prevalence and severity of nutritional anaemia among adolescents.

Objective: To assess the effectiveness of weekly iron and folic acid supplementation programme to control anemia among rural adolescent school girls in the field practice area of JJM Medical College, Davangere.

Methods and materials: A Longitudinal study with Pretest–Posttest Design was conducted in the rural field practice area of JJM Medical College among 175 adolescent school girls.

Results: The prevalence of anemia at the baseline was 38% and it reduced to 26% at the end of one year intervention. The mean haemoglobin concentration was increased by 0.37gm/dl.

Conclusion: Weekly Iron and Folic acid supplementation and regular deworming programme was beneficial to reduce the prevalence of anaemia and to improve the mean haemoglobin level of the adolescent girls. The supplementation is beneficial to both anaemic and non-anaemic girls. All the age groups were benefited from the programme.

Key Words: Weekly Iron and Folic acid Supplementation, Adolescent girls.

INTRODUCTION

World Health Organization defines adolescence as the period between 10-19 years of age.[1] India has the largest national population of adolescents (243 million), followed by China (207 million)[2]. According to Census 2011 adolescents comprise 20.9 % of total population.[3] Adolescence is the transition period between childhoods to adulthood. Period of adolescence is very crucial during which physical growth, sexual development and maturation, psychological and social development takes place[4]

In India Iron deficiency Anemia is the most widespread nutritional deficiency disorders. According to National Family Health Survey –III over 55 percent of both adolescent boys and girls are anemic. Adolescent girls in particular are more vulnerable to anemia due to rapid growth of the body and loss of blood during menstruation. More than 39% adolescent girls (15-19 years) are mildly anemic while 15% and 2% are moderate and severe anemic respectively [5].

Since it is difficult to influence dietary behavior due to social reasons and poverty, it is proposed jointly by UNICEF//WHO/Micronutrient Initiative/United Nations University that in countries where anemia prevalence exceeds 40% in pregnant women, provision of universal iron supplements for adolescent girls and women of child bearing age is necessary. Iron-folic acid supplements are cost-effective and positive results are evident in a short period of a few months [6].

Iron–folic acid supplementation of girls during adolescence has been demonstrated to be effective in meeting the increased iron requirements and in building iron stores before the onset of pregnancy 7. Weekly iron folic acid is recommended for the prevention of anemia[8] as weekly iron–folic acid supplementation has fewer side effects [9] and lower costs [10] than daily supplementation and has therefore been proposed to be more effective than daily supplementation.

As adolescent anemia is a critical public health problem in India, the Ministry of Health and Family Welfare, Government of India, has launched the Weekly Iron and Folic Acid Supplementation (WIFS) Program to reduce the prevalence and severity of nutritional anemia in adolescent population (10-19 years).

Under the WIFS program for adolescents, IFA supplements are to be distributed free of cost on a weekly basis to the target group and in addition to weekly IFA supplements, Albendazole tablets for de-worming are to be administered twice a year to the same target groups and Information and counselling for improving dietary intake and for taking actions for prevention of intestinal worm infestation [5]. There is very little data available on effectiveness of WIFS to control anaemia and with this background the present study has been undertaken.

OBJECTIVE

The objective of the study were to assess the effectiveness of weekly iron and folic acid supplementation programme to control anemia among rural adolescent school girls in the field practice area of JJM Medical College, Davangere.

MATERIALS AND METHODS

This Longitudinal study with Pretest –Posttest Design was undertaken in the field practice area of the JJM Medical College Davangere. The study was conducted in all the 5 government schools comes under rural field practice area attached to JJM Medical College and all adolescent girls aged 11 – 15 years from these 5 schools were recruited for the study. The study was conducted for one year (07-07-2013 to 06-06-2014). All adolescent school girls from the five schools who met the following Inclusion and Exclusion criteria were recruited for the study.

Inclusion criteria: Adolescents school girls aged 11 – 15 years enrolled in the WIFS program by the school authorities and consent by parents to participate in the study were included in the study.

Exclusion criteria: Adolescent school girls who don't want to participate in the study or who were likely to take transfer during the study period.

Total adolescent girls recruited for the study were 175.

After getting institutional ethical review board clearance and informed consent was taken from the district health officer, district education program officers, principals of the schools and Parents of schoolgirls for conducting the study. All the study participants were supplemented with Weekly Iron and Folic Acid (IFA) tablets comprising 100mg of elemental iron and 500 microgram of folic acid under Weekly Iron and Folic Acid Supplementation Programme (WIFS).

For estimating Hb levels two samples were collected from each participant one at baseline and another sample at the end of study period. Two ml of blood was collected in vacuum tubes containing ethylene diamine tetra acetic acid (EDTA) and used for estimating blood indices. The tubes which used were Vacolect having vacuum inside to facilitate drawing of the blood sample. Participant allowed to leave the place after five minutes if she did not report any problems such as pain, blood oozing or giddiness. The blood tubes so collected were stored in the vaccine carrier and brought to the Central Laboratory of the JJM Medical College, Davangere, for analysis. Hemoglobin estimation was done by the automated 3 part differential haematology analyser (Automated method)

Criteria for Anemia:

Hemoglobin level was used to assess the anemia & severity based on cut off values by WHO[11]. Girls were considered anemic If Hb% <12gm% which is specific for age of Adolescent girls.

Criteria for severity:

Mild anemia Hb < 11.9 to10gm Hb/100 ml blood;
Moderate anemia Hb <9.9 to 7gm Hb/100ml;
Severe anemia Hb <7gm Hb/100 ml blood

The collected information was compiled, tabulated & analyzed for results by using SPSS software package version 17. Suitable Statistical tests like Proportions, Paired –t-Test were applied

RESULTS

In our study 47 (27%) adolescent girls belonged to 11 years of age. The mean age of participants was 13 years. The average compliance rate was 58.4%.

In the current study the overall prevalence of anemia was 38%. The proportion of mild, moderate and severe anemia was 32.5%, 4.5% and 1.1% respectively. The proportion of girls with mild ane-

mia was highest (41%) among girls aged 13 years. Severe anemia was seen only among girls of 12 years (Table 1).

In the present study increase in the mean hemoglobin concentration from 12.17 g/dl to 12.54 g/dl i.e. mean rise of hemoglobin of 0.37 gm/ dl (3.7gm/L) was observed (Table 2).

Table 1: Distribution of adolescent girls according to age and type of anemia at the baseline

Age	Type of anemia				Total
	Normal (%)	Mild (%)	Moderate (%)	Severe (%)	
11	32 (68.1)	13 (27.7)	2 (4.3)	0	47
12	23 (59)	12(30.8)	2(5.1)	2(5.1)	39
13	16 (59.3)	11(40.7)	0	0	27
14	13(59.1)	7(31.8)	2(9.1)	0	22
15	24(60)	14(35)	2(5)	0	40
Total	108(61.7)	57(32.5)	8(4.5)	2(1.1)	175

Table 2: Mean rise of hemoglobin before and after intervention

Parameter	Hb gm%(Mean ± SD)
Before Intervention	12.17 ± 1.26
After Intervention	12.54 ± 1.2

*Paired t test; p< 0.001

Table 3: Distribution of adolescent girls according to grades of Anemia Before and After Intervention

Grades of anemia	Before intervention	After Intervention
Normal	108 (62%)	130 (74%)
Mild anemia	58 (33%)	40 (23%)
Moderate anemia	7 (4%)	5 (3%)
Severe anemia	2 (1%)	0 (0%)

Table 4: Age wise distribution of prevalence of anemia before and after intervention

Age	Total subjects	Before Intervention (%)	After Intervention (%)
11	47	15 (32)	14 (30)
12	39	16 (41)	10 (25.6)
13	27	11 (40.7)	5 (18.5)
14	22	9 (40.9)	5 (22.7)
15	40	16 (40)	12 (30)

In the present study, prevalence of mild anemia reduced from 33% to 23% suggesting a reduction of 10% from the base line value. Moderate and severe anemia prevalence reduced from 4 to 3% and 1 to 0% respectively. The proportion of normal (non-anemic) girls increased from 62% to 74% suggesting a rise of 20% from the baseline. Thus, the benefit of the program is reaching almost every participating adolescent girl (Table 3).

In the current study reduction of anemia prevalence was observed in all ages after intervention (Table 4).

DISCUSSION

Adolescent anemia is a critical public health problem in India. The Ministry of Health and Family Welfare, Government of India, has launched the Weekly Iron and Folic Acid Supplementation (WIFS) Program to reduce the prevalence and severity of nutritional anemia.

In the current study the overall prevalence of anemia was 38%. The proportion of mild, moderate and severe anemia was 32.5%, 4.5% and 1.1% respectively. After one year of IFA supplementation the mean hemoglobin concentration increased from 12.17 g/dl to 12.54 g/dl i.e.0.37 gm/ dl, and this difference in rise in haemoglobin level was found statistically significant. The average compliance rate was 58.4%. In the present study prevalence of all grades of anemia reduced significantly from the baseline and the proportion of normal (non-anemic) girls increased from 62% to 74%.Thus, the benefit of the program is reaching almost every participating adolescent girl.

It was observed in rise in haemoglobin concentration after IFA supplementation in the studies conducted by Deshmukh PR et al[12] (110.7+18.3 g/L to 113.7 + 17.7 g/L i.e. 0.3gm/dl), Mohan Joshi et al[13] (1.0 + 0.8 gm/dl), Prakash Kotecha[14] et al (6.4 gm/L), Agarwal KN et al[15] (10.9 ± 1.46 to 11.8 ± 1.03), Sheila CV et al[16] (10.8 to 11.8 g/dL) and Gerard JC et al[17] (122 g/L to 131 g/L).

Weekly iron-folic acid supplementation (WIFS) was proposed as a preventive long term approach to improve iron status and also for reducing the prevalence of anemia. In present study, prevalence of anemia reduced by 12%. Reduction in prevalence of anemia was also observed in the studies conducted by Deshmukh PR et al[12] (11%), Agarwal KN et al[15] (14.2%), Mohan Joshi et al[13] (31.67%), Prakash Kotecha et al[14] (21.5%) and Sheila CV et al[16] (27.5%). This difference in reduction of anemia prevalence is due to the difference in the duration of IFA supplementation and compliance rate.

The weekly administration of iron and folic acid supplements is practical and effective strategy to prevent anemia among adolescents. In present study, prevalence of mild anemia reduced by 10%. This observation is consistent with studies conducted by Deshmukh PR et al[12] (10%) and Prakash V. Kotecha et al[14] (22%). In the present study, prevalence of moderate anemia reduced by 1%. The studies conducted by Mohan Joshi et al[13] (20%), Prakash V. Kotecha et al[14] (51%), Sheila C. Vir et al[16] (18%) were also observed reduction in prevalence of anaemia. In the present study, prevalence of severe anemia reduced to nil from 1%. And similar finding is observed with study conducted by Prakash V. Kotecha et al[14] (1.6% to 0.5%).

Proportion of normal adolescent girls (Hb >12gm %) increased by 12% in our study. And similar finding was observed in Study conducted by Deshmukh PR et al[12] (10%) and Prakash V. Kotecha et al[14] (22%). The WIFS programme is effective in improving the iron status.

CONCLUSION

The weekly iron-folic acid supplementation and regular de-worming program was beneficial to reduce the prevalence of anemia and improve the mean hemoglobin status of the adolescent girls. The supplementation was beneficial to both anemic and non-anemic girls. All the age group were benefited from supplementation.

RECOMMENDATIONS

There is need to develop peer led strategy i.e. girl to girl approach in providing information and counselling about benefits of Weekly Iron and Folic acid Supplementation programme. Along with Weekly Iron and Folic acid Supplementation there is a need to include Behavioural Change Communication strategy so that students consume diet rich in iron and in the long run it will result in remarkable improvement of the iron status of the students. Further community based evaluation studies need to be undertaken to get an actual picture.

Limitations

The study did not assess external factors such as improved living standards, changed behaviors and improved nutrition which may have accounted for some of the observed improvements in haematological measures.

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