

Effect of Weekly Iron Therapy, Health Nutrition on Prevalence of Anemia in Adolescent Girls in Rohtas District, Bihar

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Abstract

Objective: To assess prevalence and reduce the incidence of anemia among the adolescent girls (10-19 years) by imparting health nutrition and with weekly iron folic acid under supervision to empower them to address their own nutrition and health issues. **Design:** Supervised community intervention of health nutrition and with weekly iron folic acid in Sasaram and Dehari community Development block of Rohtas, District in Bihar, through a network of specially trained community workers. **Settings:** Anganwadi centers and schools in rural Sasaram and Dehari community Development block of Rohtas. **Methods:** Services were rendered to adolescent girls, to assess the impact a sample size of 375 (250 school going girls and 125 non-schools going) was taken for baseline and after 6 months repeat assessment. The Hemoglobin levels were estimated, and Health Nutrition of adolescent girls was assessed before and after the intervention. Weekly supplementation of iron folic acid (IFA) tablets and biannual supplementation of Albendazole tablets was provided. The girls were also counselled on benefits of the right age of marriage on their health. **Results:** The impact of the interventions reveal a significant reduction in severe anemia from 16.0% to 8.6 %; while there was a slight increase in mild anemia from 36.0 % to 38.0 %; and a significant increase in the number of girls (47.4 % to 56.8 %) with hemoglobin level more than 12 gm/dl. **Conclusion:** The study revealed that proper counseling and implementation of with weekly supplementation of IFA tablets coupled with Albendazole tablets biannually are highly effective in reducing the prevalence of anemia among the adolescent girls.

Keywords: Adolescent girls, Anemia, Hemoglobin, IFA tablets, marriage age.

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Introduction

In India, it is estimated that adolescents constitute 21.8% of the total population and adolescent girls are estimated to be around 10% of the total population i.e. around 105 million[1]. Poor nutritional status of adolescent girls is highly prevalent in the

rural areas, and this leads to decreased anthropometric parameters.

Iron deficiency anemia is the most common nutritional deficiency and a serious health problem among the adolescent girls[2]. It has adverse effects on physical as well as

psychological development and on the behavior and work performance of the girls. Recent data from the District Nutrition Project (ICMR) in 16 districts of 11 states, on prevalence of anemia in non-pregnant adolescent girls (11-18 years) showed rates as high as 90% with severe anemia (Hb < 7 g/ dl) in 7.1%[3]. This problem can be tackled by life cycle approach and target iron supplements through infancy and childhood to adolescence and pregnancy through a preventive approach. Considering comparative feasibility and cost factor, a public health approach of educating adolescent girls about common misconceptions of society towards their health along with supplementation of once a week iron and folic acid supplementation (100 mg elemental iron and 0.6 mg folic acid) has been recommended[7]. This study was planned to find out the magnitude of anemia in adolescent girls in rural area of south Bihar and to study socio-demographic factors related to anemia.

Materials and methods

Population under Study- Present study was conducted in Sasaram and Dehari community Development block of Rohtas District in Bihar from July 2014 – June 2015. The target population was that of Adolescent girls of the area in age group of 10 to 19 years. For identification of Adolescent girls in the Rohtas District they were divided into two groups i.e. school going and non-school going. Across sectional design was adopted for study. The prevalence of malnutrition in India 21.8% India, the sample size with design effect is 375 (permissible error 0.05%)

For identification of School Going girls, 02 schools of the study area were selected by simple random sampling method to established initial content with the school officials and parents. Among the school separate groups were found for the girls of class 6-8 and class 9-10. Total 250 school going girls and 125 non-school going girls.

Listening to adolescent girls, leaning and giving recognition, Nutrition, Menstrual

cycle and related problems, General complaints and diseases i.e Body ailments, Mental disorders Reproductive diseases, Blood deficiency, Body Hygiene and Intellect, Pregnancy and problems, Contraceptives, Abortion, Care of children.

Each Adolescent girl was approached through village groups which included ICDS health and panchayats, anganwadi workers of panchayats, schools and school teachers, block levels officers' i.e. Block development officers, medical Officers, health workers ANMs, LVHs, Social workers.

Statistical Analysis

The blood sample of 375 adolescent girls from (school and non-school going). Hemoglobin level of each study subject was ascertained by acid hematin method using Sahli's Hemoglobin meter. WHO definition of anemia was used as the criteria for diagnosing anemia. This exercise was carried out twice during the study period, before and initiating the IFA supplementation.

Survey was done to pre and post intervention period and data was collected on 3 major indicators. 1) Distribution of hemoglobin level of adolescent's girls, 2) anemic adolescents girls 3) Education status of adolescents girls. Intervention was also assessed among school going and non-school going adolescent's girls. Data thus generated was analyzed and appropriate tables and figures were generated. χ^2 test was used for statistical inferences.

Result

A total of 375 adolescent was enrolled in two group, in each group divided three age group (10-13), (14-16) and (17-19) from table 1. The base line survey conducted at the beginning and past term survey. The level of hemoglobin of less than 7 gm% in school going girls was 14.4% to dropped 7.6%, and non-schooling girls was 17.6% to reduce to 9.6% similarly for girls in the range of 8-11 gm % the percentage of girls in school going girls was 38.9% to 38.0%

and non schooling girls was 34.4% to reduce to 31.2% , while the range of > 12 gm% , test of hemoglobin has gone up from 46.8 % to 54.4% in school going girls and non-schooling girls was 48.0 % to 59.2% from fig.1 and fig.2. Anemia pre

describe that hemoglobin level before any medicine and Anemia post describe that hemoglobin level after supplementation of IFA tablets coupled with Albendazole tablets.

Table 1: Age wise distribution of adolescent girl (School and non-schooling)

| Age group | School going | Non School going |
|-----------|--------------|------------------|
| 10-13 | 112 | 63 |
| 14-16 | 92 | 38 |
| 17-19 | 46 | 24 |
| Total | 250 | 125 |

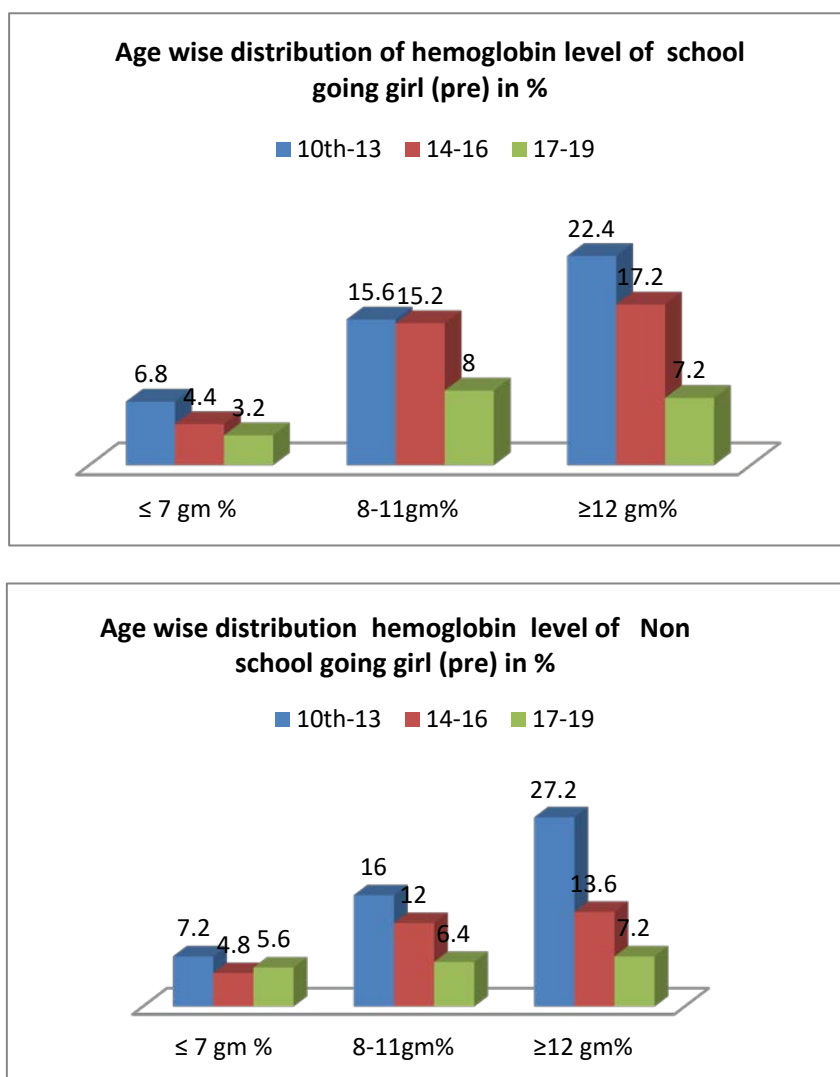


Figure 1: Age wise distribution of (pre) hemoglobin level adolescent girl (School and non schooling)

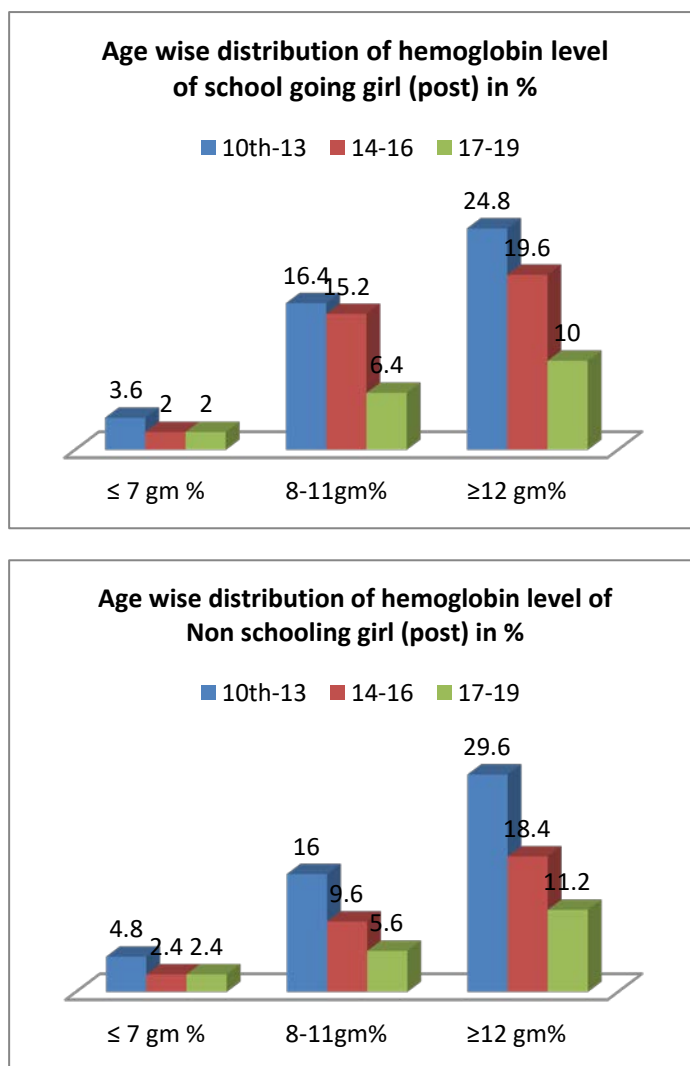


Figure 2: Age wise distribution of (post) hemoglobin level adolescent girl (School and non-schooling)

Table 2: Age wise distribution of Anemia Pre

| Age group | School going | | Total | Non School going | | Total |
|-----------|---|---------------|-------|--|---------------|-------|
| | Present No (%) | Absent No (%) | | Present No (%) | Absent No (%) | |
| 10-13 | 56(2.4) | 56 (22.4) | 112 | 29 (23.2) | 34(27.2) | 63 |
| 14-16 | 49 (19.6) | 43 (17.2) | 92 | 21(16.8) | 17(13.6) | 38 |
| 17-19 | 28 (11.2) | 14 (7.2) | 46 | 15 (12.0) | 9(7.2) | 24 |
| | 133 (53.2) | 117(46.8) | 250 | 65 (52.0) | 60 (48.0) | 125 |
| | X ² = 3.45 df= 2, p = 0.1782 | | | X ² = 2.12 df= 2, p= 0.3465 | | |

Table 3: Age wise distribution of Anemia Post

| Age group | School going | | Total | Non School going | | Total |
|-----------|---|---------------|-------|---------------------------------------|---------------|-------|
| | Present No (%) | Absent No (%) | | Present No (%) | Absent No (%) | |
| 10-13 | 50 (20.0) | 62 (24.8) | 112 | 26(20.8) | 37(29.6) | 63 |
| 14-16 | 33 (13.2) | 59(23.6) | 92 | 15(12.0) | 23(18.4) | 38 |
| 17-19 | 21 (8.4) | 25(10.0) | 46 | 10(8.0) | 14 (11.2) | 24 |
| | 104 (41.6) | 146 (58.4) | 250 | 51 (40.8) | 74(59.2) | 125 |
| | X ² = 1.98 df= 2, p = 0.3716 | | | X ² = .09 df= 2, p= 0.9802 | | |

Table 4: comparison of anemia with school going and nonschool going

| Age group | School going | | Non School going | |
|-----------|--------------|-------------|------------------|-------------|
| | Pre No (%) | Post No (%) | Pre No (%) | Post No (%) |
| 10-13 | 56(22.4) | 50(20.0) | 29(23.2) | 26(20.8) |
| 14-16 | 49(19.6) | 33(13.2) | 21(16.8) | 15(12.0) |
| 17-19 | 28(11.2) | 21(8.4) | 15(12.0) | 10(8.0) |
| Total | 133(53.2) | 104(41.6) | 65(52.0) | 51(40.8) |

Table 5: Socio economic status and anemia

| SES | School going | | Total | Non School going | | Total |
|-------------|---------------------------------------|---------------|-------|--|---------------|-------|
| | Present No (%) | Absent No (%) | | Present No (%) | Absent No (%) | |
| Class I &II | 42(16.8) | 45(18.0) | 87 | 20(16.0) | 19(15.2) | 39 |
| Class III | 47(18.8) | 51(20.4) | 98 | 29(23.2) | 27(21.6) | 6 |
| Class IV &V | 44(17.6) | 21(8.4) | 65 | 18(14.4) | 12(9.6) | 30 |
| Total | 133(53.2) | 117(46.8) | 250 | 65(52.0) | 60 (48.0) | 125 |
| | X ² = 7.41 df= 2, p= 0.026 | | | X ² = 0.65 df= 2, p= 0.7225 | | |

Comparison of anemia status between school going and non-school going girls was also done from table-4 shows that 53.2% anemic reduce to 41.6% in school going girls and non-school going girls was 52.0% to 40.8%. The result of both the survey reveals an approximately significant and table- 5 describe socio economic status and anemia. In this table all classes approximately equally distributed with present anemia in school going and non-school going girls is significant.

Discussion

Kotecha et al[7], reported reduction in anemia prevalence (n = 69000) by 21.5 per cent that is, from 74.7 per cent to 53.2 per cent ($P<0.05$) in a pilot program in Vadodara district of Gujarat covering over 69000 girls in over 426 schools. Study also included knowledge and practices of the

adolescent girls with reference to their dietary habits and package of intervention included nutrition education through schools by providing information and education material prepared by the government and the results are consistent with our study.

S. Kaur et al reported prevalence of anemia to be 59.8 % (n = 630) in cross sectional study among Adolescent Girls of Rural Wardha, No intervention was done in study population. In univariate analysis, low socioeconomic status, low iron intake, vegetarian diet, history of worm infestation and history of excessive menstrual bleeding showed significant association with anemia. While Multivariate logistic regression analysis suggested that strongest predictor of anemia was vegetarian diet (OR=5.83, CI=3.73-9.13) followed by history of excessive menstrual bleeding

(OR=5.65, CI=1.26-25.38), iron intake <14mg (OR=4.16, CI=2.08-8.31) followed by 14-20mg (OR=2.07, CI=1.06-4.05) and history of worm infestation (OR=4.11, CI=1.70-9.93). However age, education, socioeconomic status, BMI and status of menarche did not contribute significantly[8]. In contrast our study showed that by just educating the girls about family life along with weekly supplementation of IFA and Albendazole tablets can make a big difference.

Binay Kumar Shah and Piyush Gupta from the Departments of Pediatrics, B.P. Koirala Institute of Health Sciences, Dharan, Nepal and University College of Medical Sciences, Delhi reported the prevalence of anemia in adolescent Nepalese girls (n=209), information was collected on menarcheal status and socio-demographic profile, anthropometric examination and hematocrit estimation. The overall prevalence of anemia was found to be 68.8%. This prevalence was not related to girls' age, body mass index, menarcheal status, and socio-demographic factors including parental education or occupation ($p = 0.05$).

Jolly Rajaratnam et al from the Ruhsa Department, Christian Medical College and Hospital, Vellore District, Tamilnadu, India, reported prevalence of anemia to be 44.8% with severe anemia being 2.1%, moderate 6.3% and mild anemia 36.5%. There was a decrease in the prevalence as the age increased, however the difference was not statistically significant. The prevalence of anemia was 40.7% in premenarcheal girls as compared to 45.2% in post menarcheal girls. There was reduction in the mean Hb as the age increased. A similar decreasing trend was observed with increasing age at menarche of the girls and also earlier the age at menarche, the higher was mean Hb. The mean Hb of premenarcheal girls was 11.63 g/dl (SD 1.5) and that of post menarcheal girls was 11.52 g/dl (SD 1.54). A significant association was found between the hemoglobin concentration and the

girls' education and her mother's educational status, which again is similar to present study. There were marginal differences in prevalence of anemia and mean Hb in relation to anthropometry which were not statistically significant. In the multiple regression analysis also girl's education, mother's education and the family type were identified as independent predictors for hemoglobin concentration. None of the other socioeconomic variables and nutritional status were picked up as independent significant predictors[9].

Thus, present study showed that proper counseling and implementation of Knowledge Attitude and Practice along with weekly supplementation of IFA tablets coupled with Albendazole tablets are highly effective in reducing the prevalence of anemia among the adolescent girls.

Conclusion and recommendation

The high incidence of anemia in Adolescent girls has gained importance in recent past. The current study has shown that the prevalence is alarmingly high (53.2%) in school going and non school going girls in (52.0%). Though various factors contribute to prevalence of anemia, this study shown that socio-economic status, age menarche and anthropometry are major contribution. After give-up weekly supplementation of iron folic acid (IFA) tablets and biannual supplementation of Albendazole tablets then prevalence of anemia reduce to (41.6%) in school going and non school going girls in (40.0%) which are also high. Show recommended for consumption of iron folic acid (IFA) tablets through AWC. Consequence and the ways of prevention. It is recommended to educate the girls, her mother and the school teachers regarding the causative factors, Consequences and the ways of prevention. They should be made aware of low cost, iron rich food. This will definitely enhance the health of adolescent girls so that they are prepared

for bigger challenges like pregnancy in later life. Millenium development Goals (MDGs) aimed at reduction of Infant and maternal mortality. To achieve this, we have to address anemia in adolescent girls. Adolescence, as a period of growth and development, is considered as the best time to assist in physical and mental development, which can prevent maternal anemia later.

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