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Dr. Pooja Chaturvedi
Programme Assistant Krishi Vigyan Kendra, Narsinghpur, Madhya Pradesh, India

Dr. Aruna Palta
Principal, Naveen Kanya College, Raipur, Chhattisgarh, India

Dr. KV Sahare
Senior Scientist & Head Krishi Vigyan Kendra, Narsinghpur, Madhya Pradesh, India

Dr. Ashutosh Sharma
Scientist Krishi Vigyan Kendra, Narsinghpur, Madhya Pradesh, India

Correspondence
Dr. Pooja Chaturvedl
Programme Assistant Krishi Vigyan Kendra, Narsinghpur, Madhya Pradesh, India

Assessment of impact of iron supplementation amongst anaemic adolescent school girls of Raipur city

Dr. Pooja Chaturvedi, Dr. Aruna Palta, Dr. KV Sahare and Dr. Ashutosh Sharma

Abstract
Iron deficiency anaemia is a global public health problem, Adolescence is a crucial phase of growth since it offers the second and last chance for catch up growth in the life cycle of individuals. It is crystal clear that the role of low birth weight, prematurity and neonatal infant mortality among children born to malnourished adolescent girls is high. So the best way to combat anaemia is supplementation with Iron and folic acid tablets as the absorption of iron from Indian dietaries is too low. 360 anaemic adolescent girls of high school of Raipur City were selected for the study and categorized into two groups. The first group, which as experimental group, was given supplementation with iron and folic acid tablets, while the second group which was the control group was provided only with nutrition education The subjects of experimental group were provided with different types of supplementation i.e. once week, twice a week and thrice a week respectively. Their haemoglobin value was estimated using Cyan met method. After three months of continuous supplementation again haemoglobin estimation of subjects was done. The study revealed that role of iron and folic acid supplementation is important in improving the haemoglobin level of anaemic adolescent girls. Twice a week supplementation has proved to be more effective and economical as compared to once a week and thrice a week supplementation. The prevalence of anaemia amongst the adolescent girls of this region seems to be very high, so there is an urgent need for assessment, advocacy, prevention and control initiatives to be developed in India to reduce anaemia in adolescent girls.

Keywords: Anaemia, adolescent girls, lion folic acid supplementation, haemoglobin estimation

Introduction
Anaemia is a major public health problem in the world today. Studies have revealed that 65 percent to 75 percent of the adolescent girls in India are anaemic [1], Adolescent girls are an important section of our society as they are our potential mothers and future homemakers [2]. Adolescent girls are particularly prone to iron deficiency anaemia because of the increased demands of iron by the body [3]. This anaemia not only affects the present status of health of the adolescent girls, but also shows a deleterious effect when these girls become future mother. A satisfactory hemoglobin status at the time of conception results into safe pregnancy and healthy child birth. This could be attained only when the status of hemoglobin is improved in adolescent girls. In order to prevent high maternal mortality and high incidence of low birth weight babies in India, there is a need to combat anaemia in adolescent girls. Protein and iron rich diet can improve the hemoglobin status only to some extent. Iron Status during adolescence may be to increased further by low dietary intake [5]. So the absorption of Iron from Indian dietaries is too low [4]. The best way to combat anaemia is, supplementation with iron and folic acid tablets. With an objective to assess the effectiveness and frequency of iron and folic acid supplementation, this study has been planned among the school going adolescent girls of Raipur City of Chhattisgarh State.

Methods and Material
The experimental procedures adopted for the study are outlined as under:

Screening of Anaemic Girls
(a) Selection of Samples
Samples were taken from different government high schools of Raipur City of Chhattisgarh State. They were selected after their initial screening for haemoglobin levels. A sample of 360 school going adolescent girls was selected on the basis of purposive sampling method. The date of birth and the age of subjects were confirmed from the school Records.

These subjects were again divided into two groups i.e. 13-15 years (early adolescence) and 16-18 years (late adolescence).

(b) Estimation of Haemoglobin
Estimation of haemoglobin was carried out by Cyan met method.

Categorisation for Anaemia
The subjects were categorized as per the WHO (World Health Organization) standard for anaemia into mild, moderate and severe categories. Subjects having haemoglobin levels between 10.1—12.0 g/dl were considered to be suffering from mild anaemia, 7—10 g/dl from moderate anaemia and below 7 g/dl from severe anaemia. 120 girls were taken from each category and thus the sample consisted of 360 girls.

Formation of Experimental and Control Groups
Subjects selected were divided into two groups. Out of 360 anaemic girls, 270 girls were kept in experimental group while the remaining 90 girls were kept in control group.
Out of 270 girls, 90 girls were from the mild anaemia category, 90 from moderate anaemia category, and the remaining 90 girls were from the severe anaemia category. Similarly, in the control group 30 subjects were from the mild anaemia category, 30 from moderate and the remaining 30 were from the severe anaemia category.

Deworming the Subjects
Deworming of the selected samples was done before starting supplementation of iron and folic acid in order to get the best utilization of these nutrients. Deworming tablets were given to the girls, as suggested by the physician.

Iron and Folic Acid Supplementation
After deworming of the subjects, iron and folic acid supplementation was started. 90 subjects of 'mild' category of experimental group were again divided in to three groups. These three groups of 30 subjects each were provided with three different types of supplementation of iron and folic acid tablets i.e. once a week, twice a week and thrice a week respectively. Similar division was done for the 90 subjects of 'moderate' and 90 subjects of 'severe' category also.
90 subjects of control group were not given any supplementation. They were only provided with nutrition education. After supplementation of iron and folic acid for three months, again haemoglobin levels were estimated and comparison with previous haemoglobin levels were made.

Statistical Analysis
Mean, standard deviation and't' test were applied for statistical analysis of data.

Findings and Discussion
Table 1 depicts the distribution of 360 anaemic subjects selected for the study.

Table 1: Distribution of 360 anaemic subjects according to their Supplementation

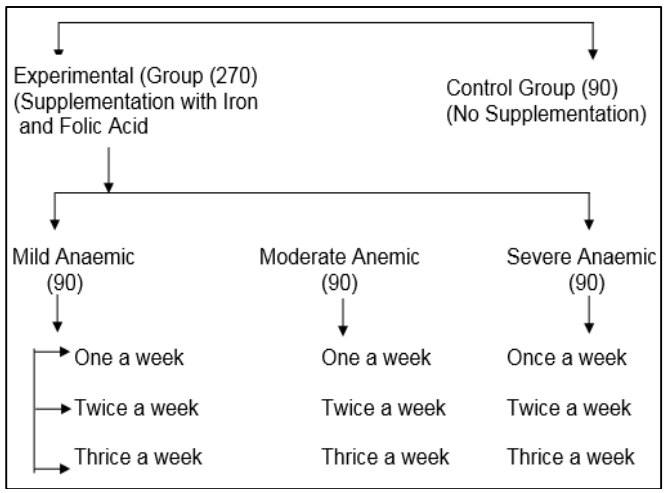

Table 2 shows the prevalence of anaemia amongst the adolescent girls of this region which seems to be very high (82%). Out of the subjects screened for anaemia, 28 per cent revealed mild degree of anaemia, while 32 per cent and 22 per cent were suffering from moderate and severe anaemia respectively. Only 18 per cent girls were within the normal limits of haemoglobin levels.

Table 2: Prevalence of Anaemia

Severity of Anaemia	Number of Subjects	Percentage (%)
Normal	78	18
Mild	125	28
Moderate	140	32
Severe	97	22
Total	440	100

Table 3 depicts that 89 girls had mild anaemia, 63 girls had moderate anaemia, and 69 girls had severe anaemia in the age group of 13-15 years. The total number of subjects in his age group was 221. Similarity, 31 girls had mild anaemia, 57 girls had moderate anaemia and 51 girls had severe anaemia in the age group of 16-18 years. The total number of subjects in this age group was 139. But overall distribution of the subjects for mild, moderate and severe anaemia was 120, 120 and 120 each when combined for both the age groups.

Table 3: Distribution of 360 Anaemic Girls Selected for the Study, AS Per Their Age

Age Group (year)	Mild Anaemic (10-12 g/dl)	Moderate Anaemic (7-10 g/dl)	Severe Anaemic (blow 7 g/dl)	Total No.
13-15	89	63	69	221
16-18	31	57	51	139
Total	120	120	120	360

Table 4 depicts the mean haemoglobin values of mild anaemic subjects before and after supplementation. The subjects who received supplementation, only once a week, their mean haemoglobin value before supplementation was 10.80 g/dl. After 12 weeks of supplementation it became 12.65 g/dI. Similarly the subjects of second group who received supplementation twice a week, their mean haemoglobin value before supplementation was 10.69 g/dl, Which elevated to 14.10 g/dl, after 12 weeks of Supplementation. The last group of 30 girls, who were provided supplementation thrice a week, their mean haemoglobin value before supplementation was 10.73 g/dl and after supplementation it was 14.63 g/dl. The difference between the mean values was calculated by computing it values and significant difference was observed in all the three group

Table 4: Mean haemoglobin values of Mild Anaemic Subjects 'Before' and after supplementation

Supplementation	Mean Heamoglobin (g/dl) Before Supplementation (N=30) +S.D.	Mean Heamoglobin (g/dl) after Supplementation (N=30) +S.D.	't' Value
Once a Week	10.80 (±0.46)	12.65 (±0.75)	12.00*
Twice a week	10.69 (±0.36)	14.10 (±0.65)	22.50*
Thrice a Week	10.73 (±0.34)	14.63 (±0.69)	19.20*

* Significant at one percent level

The mean haemoglobin values of the moderate anaemic subjects is shown in Table 5. Table reveals that the subjects who received supplementation only once a week, their mean haemogtobin value before supplementation was 9.26 g/dl, which after twelve weeks of supplementation became 10.42 g/dl. The subjects of second group who received supplementation twice a week, their mean haernoglobin value before supplementation Was 9.12 g/dl and after twelve weeks of supplementation it became 12.46 g/dl. Similarly third group of 30 subjects who were given supplementation thrice a week, their mean haemoglobin value before supplementation was 9.49 g/dl which became 12.87 g/dl after supplementation. The difference between the mean values was found to be significant in all the three groups of moderate anaemic subjects.

Table 5: Mean haemoglobin values of Moderate Anaemic Subjects 'Before' and 'after' supplementation

Supplementation	Mean Heamoglobin (g/dl) Before Supplementation (N=30) +S.D.	Mean Heamoglobin (g/dl) after Supplementation (N=30) +S.D.	't' Value
Once a Week	9.26 (±0.31)	10.42 (±0.75)	10.50*
Twice a week	9.12 (±0.48)	12.46 (±0.65)	22.50*
Thrice a Week	9.49 (±0.69)	12.87 (±0.72)	19.20*

* Significant at one percent level

Table 6 indicates the mean haemoglobin value of severe anaemic subjects. The mean haemoglobin value of the subjects, who received supplementation once a week was 6.30 g/dl. After twelve weeks of supplementation it became 7.94 g/dl. The subjects of second group who were provided tablets twice a week. their initial mean value was 6.45g/dl, which was elevated to 10.53 g/dl after supplementation. Similarly last group of 30 subjects who received supplementation thrice a week, their mean haemoglobin before supplementation was 6.72 g/dl and it became 11.23 g/dl after supplementation. The difference between the mean values was found to be significant in all the three groups of severe anaernic subjects.

Table 6: Mean haemoglobin values of severe anaemic subjects 'before' and 'after' supplementation

Supplementation	Mean Heamoglobin (g/dl) Before Supplementation (N=30) +S.D.	Mean Heamoglobin (g/dl) after Supplementation (N=30) +S.D.	't' Value
Once a Week	6.30 (±0.56)	7.94 (±0.53)	12.00*
Twice a week	6.45 (±0.45)	10.53 (±0.36)	40.30*
Thrice a Week	6.72 (±0.40)	11.23 (±0.96)	24.60*

* Significant at one percent level.

Table 7 reveals the mean haemoglobin values of 'control group'. This group was not given any supplementation. It was only provided with nutrition education. The mean haemoglobin values of mild anaemic subjects before experiment was 10.79 g/dl, which after nutrition education became 11.03 g/dl. After computing't' value, no significant difference was observed between the two means of mild anaemic subjects. In the Moderate anaemic subjects, their mean haemoglobin value before experiment was 8.71 g/dl and after experiment it was 9.70 g/dl. Similarly mean haemoglobin value of severe anaemic subjects before experiment was 6.71 g/dl and after experiment it was 7.47 g/dl. The mean difference was found to be significant between the mean values of both the moderate and severe anaemic subjects.

Table 7: Mean Haemoglobin values of control group 'before' and 'after' supplementation

Supplementation	Mean Heamoglobin (g/dl) Before Supplementation (N=30) +S.D.	Mean Heamoglobin (g/dl) after Supplementation (N=30) +S.D.	't' Value
Once a Week	10.79 (±0.56)	11.03 (±0.53)	1.36 (NS)
Twice a week	8.71 (±0.45)	9.70 (±0.36)	4.30*
Thrice a Week	6.71 (±0.40)	7.47 (±0.96)	5.42*

NS= Not Significant

* Significant at one percent level.

It can be observed from the tables that iron and folic acid supplementation can definitely help in improving the haemoglobin levels of adolescent girls. Although there was a significant increase in blood haemoglobin levels of all the three groups of mild, moderate and severe categories of experimental group, but it was found that from all the three types of supplementation twice a week supplementation has proved to be more effective and economical as compared to once a week and thrice a week supplementation.

Nutrition education also plays a role in improving the nutritional status but only to limited extent as is evident from the case of control group. It is a well-known fact that even protein and iron rich diets can improve the haemoglobin status only to some extent. So to increase awareness, nutritional education is good but to improve haemoglobin levels, supplementation is a must. The results of the study can serve as a guideline for distributing iron tablets in educational institutes. Unfortunately, adolescent girls are a neglected sector of the population of our country. So, there is an urgent need to include adolescent girls in the risk category if the iron status of our potential mothers and future homemakers is to be optimum.

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Reference

1. Kanani S. Strategies for Combating Anaemia in Adolescent Girls, Indian J. Pediater. 1995; 62:375-377.
2. Dallman PR, Simes MA, Stekel A. Iron Deficency and Childhood Am. I. Clin. Nutr. 1980; 33:86-118.
3. Child in India, Government of India, Ministry of Welfare, 1985, 25.
4. Narasinga Rao BS. Bio Availability of Dietary Iron, Nutrition Society of India, Hyderabad, 1983.
5. Institute of Medicine Iron Deficiency Anaemia: Recommended Guideline for the Prevention, Detection and Management among US. Children and Women of Child Bearing Age. National Academy Press, Washington, 1993.