International Journal of Contemporary Pediatrics
Chaturvedi D et al. Int J Contemp Pediatr. 2017 Jul;4(4):1165-1168
http://www.ijpediatrics.com
pISSN 2349-3283 | eISSN 2349-3291

DOI: http://dx.doi.org/10.18203/2349-3291.ijcp20172022

Original Research Article

Study of correlation between dietary habits and anemia among adolescent girls in Ranchi and its surronding area

Deepak Chaturvedi*, Partha Kumar Chaudhuri, Priyanka, Anil Kumar Chaudhary

Department of Pediatrics, Rajendra Institute of Medical Sciences Ranchi, Jharkhand, India

Received: 18 April 2017
Accepted: 22 April 2017

***Correspondence:**
Dr. Deepak Chaturvedi,
E-mail: drdpksagar@gmail.com

ABSTRACT

Background: It is astonishing to know that 30% of world population suffers from IDA out of which 80 to 90% is in developing countries. In India, 80% of children at 1 to 2 years of age, adolescents, pregnant women and lactating mothers suffer from Iron deficiency. Nutritional anemia is a worldwide problem with prevalence in developing countries (36%) compared to industrialized (8%). Most of the problems are related to dietary habits from initial age of a child. Girls are more at risk because of menstrual Issues and early age marriage.
Methods: The present study was conducted on 300 adolescent girls (10-19 years) by asking their last 24 hours' dietary habits.
Results: Among 300 girls 39% were vegetarians and remaining 61% were non-vegetarians. Maximum girls (78%) were in the frequent habit of consumption of junk foods. Mild anemia (34%) was found to be more common than other forms of anemia. Severity of anaemia was found to be gradually increased from early to late adolescent group.
Conclusions: Anaemia noted in 82% despite majority (91.7%) of girls having normal BMI. Anemia was more common in vegetarians than non-vegetarians and among vegetarians more common with predominantly rice based diet ('r'=0.871). There was increased association on consumption of tea and coffee post meals (r=0.892).

Keywords: Adolescent girls, Anemia, Dietary habits

INTRODUCTION

It might appear astounding to know that 30% of world population suffers from IDA out of which more than 80 to 90% is in developing countries. Still more astonishing is the fact that about 80% of children at 1 to 2 year of age, adolescent, pregnant women and lactating mothers suffer from iron deficiency in India.[1,2] Therefore India falls in the category of high prevalence for nutritional anemia. However, the focus of this discussion is primarily on adolescent girls.[3]

Adolescence is considered as a bridging period from childhood to adulthood.[4] As per a WHO report, pediatricians are the first contact point for various health problems of children and adolescent till 19 years of age. It has also been noted that most of the problems are related to dietary habits from initial age of a child. These habits lead to micro and macro nutritional deficiencies. Of all the deficiencies, the iron deficiency is most common causing iron deficiency anemia and various other health issues.[5] Nurturing a girl child from her infancy to childhood to adolescence is of paramount importance and by intervening at adolescent age of a girl we could stop the vicious cycle of ill health and contribute towards a healthier nature and society.

Nutritional anemia is a worldwide problem with prevalence in developing countries (36%) compared to industrialized developed countries (8%).[6] It is a

disheartening to note that the numbers have increased from NFHS-2 to NFHS-3 and 4. It is found especially among young children, adolescent girls, women of child-bearing age, during pregnancy and lactation. Iron deficiency can arise either due to inadequate intake or poor bio-availability of dietary iron or due to excessive loss of iron from the body.[7] Girls are more at risk as they lose a considerable amount of iron during menstruation.[8] Some of the other factors leading to anemia are malaria and hookworm infestations. Among adolescents, girls constitute a vulnerable group, particularly in developing countries when they are married at an early age and get exposed to a greater risk of reproductive morbidity and mortality. They are deprived of food and education and the added burden of normal/abnormal menstrual blood loss which precipitates the crisis too often.[9]

Adolescent girls are particularly prone to iron deficiency anemia because of the increased demands of iron by the body. This anemia not only affects the present status of health of the adolescent girls, but also shows its deleterious effect when these girls become mothers. A satisfactory hemoglobin status at the time of conception results in safe pregnancy and healthy child birth. This could be attained only when the status of hemoglobin is improved in adolescent girls.

METHODS

Target group

300 adolescent girls of age group 10-19 years who were studying in two Government Higher Secondary Schools of Ranchi from period of July 2015 to July 2016 were studied.

Inclusion criteria

The study included adolescent girls

- With apparently normal appearance
- Age group between 10-19 years, and
- Who were willing to participate in the study

Exclusion criteria

The study excluded adolescent girls

- Who were associated with other systemic disease conditions,
- Who were taking iron or any multi vitamin/mineral in the form of medicine

The design of this study was analytical cross sectional epidemiological study.

Method of collecting samples and analysis

The information was collected from primary as well as secondary sources. In primary source, questionnaire-cum-interview technique was used. In secondary source, journals, books and related literature were studied.

The written permission from the authorities of the selected institution obtained prior to data collection. Consent obtained from study participants or her parents after explaining the objectives of study. Pre-designed questionnaires provided to assess age, height, body weight, and the dietary patterns comprising food habits of adolescents, in which the questions were asked on the types of foods consumed in the last 24 hours (recall method), consumption of breakfast, and their habit of skipping meals. Specific foods listed as junk food included: chocolates, potato chips, soft drinks, cookies, cake, brownies, pizza, ice cream, and french fries. The general information about parent's education, parent's occupation, socioeconomic status (using modified kuppuswamy's scale), knowledge about anaemia and status of menstruation recorded.

Hematological parameters were obtained using automated haematology cell counter and peripheral blood smears by microscopy. Anemia was diagnosed at hemoglobin level of less than 12gm/dl (WHO).[10]

RESULTS

For better correlation and computation of data total number of participants in study were divided into 3 subgroups early adolescent (10 to 12 years), mid adolescent (13 to 15 years) and late adolescent (16 to 19 years). Each sub groups have 100 individuals. Frequency distribution of the participants is depicted in Table 1.

Table 1: Showing frequency distribution.

Age (years)	Frequency	Sub groups
10	30	100 (Early adolescent)
11	55	
12	15	
13	36	100 (Mid adolescent)
14	29	
15	35	
16	23	100 (Late adolescent)
17	38	
18	27	
19	12	
Total	300	300

In present study of 300 girls, 117 were vegetarians and remaining 183 were non-vegetarians. As shown below in Table 2.

Table 2: Type of diet.

Type of diet	Frequency	%
Vegetarians	117	39
Non-vegetarians	183	61
Total	300	100

Table 3 represents frequent feeding habits of the 300 girls who participated. Out of these 32% took tea/coffee post meal frequently, 36% consumed fruits / fruit juices frequently, 39% had green leafy vegetables frequently and surprisingly 78% were in the habit of taking junk foods frequently (Table 3).

Table 3: Depicting dietary habits among participants.

Dietary habits	Frequency	%
Tea/coffee post meal	97	32
Fruits/fruits juice frequently	108	36
Green leafy veg. frequently	116	39
Junk foods frequently	233	78

Among 300 participants, 246 (82%) were anaemic, 102 (34%) girls had Mild anaemia (Hb:9-12gm%), 91 (30.3%) had Moderate anaemia (Hb:6-9gm%) and 53 (17.6%) were Severely anaemic (Hb <6gm %) In early and late adolescent group mild anaemic cases were common, while in mid adolescents moderate anaemia was observed commonly. Severity of anaemia gradually increased from early to late adolescent group (Table 4).

Table 4: Describing severity of anemia.

Age groups	Non-anaemic	Mild	Moderate	Severe
10-12 years (Early)	23	41	27	9
13-15 years (Mid)	15	28	41	16
16-19 years (Late)	16	33	23	28
Total	54	102	91	53

DISCUSSION

During adolescent period requirement of iron is significantly increased. Anemia is widely prevalent and is a major cause of morbidity. Globally anemia affects billions of people.[11] Prevalence of anemia in our study was 82%. This was comparable with average anemia rate in India. Though prevalence rate of 82% is quiet high as compared to 72.6% prevalence estimated by District Level Health Survey (DLHS 2002-04), this survey was done around 15 years back so difference in prevalence is quite possible due to change in life style and food taboos. Same survey found higher prevalence of severe anemia (21.1%) in comparison to this study (17.6%). According to national statistics of India, Bihar had the highest prevalence (87.6%).[12] Jhakhand being part of Bihar before 2000 as well as having same food practices also corresponds to the same.

In adolescent girls, educational or economic status does not seem to make much of a difference in terms of prevalence of anemia. Prevention, detection, or management of anemia in adolescent girls has till now not received much attention. Therefore, results obtained from this study can be extrapolated to state as well as national level.

Study conducted by Rati et al on 240 adolescent girls of bijapur showed prevalence of mild (48.75%), moderate (42.5%) and severe anemia (8.75%).[5] Prevalence of mild and moderate anemia was more in that study while severe anemic cases were more in our study. On comparing type of diet anemia was more common in vegetarians as with this study. Kaur IP and Kaur S found 98% Punjabi girl's anemic, with maximum cases of moderate anemia.[7] Study conducted by Dixit et al on 586 adolescent girls of lucknow revealed 83.3% anemia prevalence which is quite comparable to present study.[8]

Panat et al studied 273 girls of Ahmed nagar, Maharashtra and found more prevalence of mild anemia and anemia was significantly common among girls who were in habit of post meal tea consumption which is comparable to this study.[9] They also observed a very weak positive correlation between normal BMI and hemoglobin and very weak negative correlation between low and high BMI and hemoglobin but all these were statistically insignificant. In our study anemia was diagnosed even among girls who had normal BMI. In addition to dietary habits anemia in early adolescent group may be due to parasitic infestation etc, while in mid adolescent girl's menstrual issues may be a significant cause. In many similar studies, it was found that anemia is a common problem in adolescent age group due to improper diet and lack of awareness of nutrition.

It is evident that adolescent girls are at a higher risk for anemia. Very often in India, girls get married and get pregnant even before the growth period is over, deteriorating the situation further. The present study concluded higher prevalence of anemia 82% despite majority i.e. (91.7%) of girls having normal BMI. There was higher prevalence of mild anaemia (34%). Anemia was more in vegetarians than nonvegetarians and among vegetarians more common with predominantly rice based diet ('r'=0.871). There was higher incidence of anemia with low intake of iron and vitamin-C rich food. Increased association on consumption of tea and coffee post meals ('r'=0.892) and higher incidence in girls who had attained menarche and having irregular and profusely bleeding menstrual periods was observed.

CONCLUSION

Thus, this study highlights that adolescent girls are at a higher risk for anemia. Mild anemia (34%) was found to be more common than other forms of anemia. Severity of anemia was found to be gradually increased from early to late adolescent group. Anaemia noted in 82% despite majority (91.7%) of girls having normal BMI. Anemia was more common in vegetarians than non-vegetarians and among vegetarians more common with

predominantly rice based diet ('r'=0.871). There was increased association on consumption of tea and coffee post meals ('r'=0.892). Maximum girls (78%) were in the frequent habit of consumption of junk. Study showed that 85.83 % adolescent girls (200/233) who consumed junk foods frequently were anaemic ('r' =0.917).

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Lokeshwar MR, Textbook of pediatric hematology and hemato-oncology, 1st ed. New Delhi,Jaypee brothers medical publishers;2016:100-25.
2. Klieman RM, Nelson textbook of pediatrics, 20th ed. Philadelphia, Elsevier;2016:2323-6.
3. Paul VK, Bagga A, Ghai. Essential Pediatrics, 8th ed. New Delhi, CBS publishers;2014:330-58.
4. Blaci Y. Prevalence and risk factors of anemia among adolescents in denizli, turkey, Iran J Pediatr. 2012;22(1):77-81.
5. Rati S, Jawadagi S. Prevalence of anemia among adolescent girls studying in selected schools, IJSR 2014; 3(8):1237-42.
6. Montazerifar F, Karajibani M, Dashipour AR. Evaluation of dietary intake and food patterns of adolescent girls in sistan and baluchistan province, iran, Functional Foods in Health and Disease. 2012; 2(3):62-71.
7. Kaur IP, Kaur S. A comparison of nutritional profile and prevalence of anemia among rural girls and boys, Journal of Exercise Science and Physiotherapy. 2011;7(1):11-8.
8. Dixit S. A community based study on prevalence of anaemia among adolescent girls and its association with iron intake and their correlates, Indian J. Prev. Soc. Med. 2011;42(4):393-8.
9. Panat AV. Iron deficiency among rural college girls: a result of poor nutrition and prolonged menstruation, JCNH. 2013;2(2):56-60.
10. Haider R, Bhatia S. Adolescent Nutrition: A Review of the Situation in Selected South-East Asian Countries, New Delhi, WHO;2006:21-42.
11. Parthasarathy A, IAP Text book of pediatrics, 6th ed. New Delhi, Jaypee brothers medical publishers; 2016:755-60.
12. Park K, Textbook of Preventive and social medicine, 24th ed. Jabalpur, M/s Bansidas bhanot publisher;2016:646-704.

Cite this article as: Chaturvedi D, Chaudhuri PK, Priyanka, Chaudhary AK. Study of correlation between dietary habits and anemia among adolescent girls in Ranchi and its surronding area. Int J Contemp Pediatr 2017;4:1165-8.