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To Assess the Knowledge of Anaemia among Studied Population of Shimla Hills

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ABSTRACT

Anaemia is one of the major public health problems, affecting both sexes and all ages. It adversely affects the cognitive performance, behaviour, and physical growth of infants, preschool and school-aged children. In view of the immense public health consequences of anaemia this study was conducted in the field practice areas of Department of Community Medicine, IGMC, Shimla, for a period of one year. A total of 421 girls were studied. They were clinically examined, & predesigned & pre tested proformas were filled up. Haemoglobin assessment was done using Filter paper Cyanmethemoglobin technique. It was concluded that girls who were aware about sources of iron rich diet, adverse effect of anaemia on academic performance and increased requirement of iron by the girls, were less likely to be anaemic.

Keywords: Anaemia, Cyanmethemoglobin, Haemoglobin, Nutrition, folic acid, vitamin B12

I. INTRODUCTION

One common etiological classification of anaemia identifies three main causative groups of anaemia nutritional, marrow disease and hemolytic. Nutritional anaemia is by far the most common type of anaemia worldwide and mainly includes iron, folic acid and B12 deficiencies. By far the most common cause of nutritional anaemia is iron deficiency anaemia which itself is caused by insufficient dietary intake of iron, chronic gastrointestinal bleeding especially from hookworm infestation, malabsorption conditions and infection.

Anaemia can affect psychological and physical behaviour. Several studies have shown that anaemia affects cognitive functioning, growth, motor performance and educational achievements. According to Food policy 2003 study, anaemia in adults & children cost developing countries billions of dollars. Adults who lack sufficient iron in their diets are more lethargic which leads to lower productivity. The study also indicated that on an average, a country loses 0.6% of its gross domestic product (GDP) due to physical productivity loses from adults lacking iron. When learning & motor impairment in anaemic children is added the figure rises dramatically to 4% of its GDP.

For a pregnant woman anaemia can result in severe morbidity and reduces the resistance to blood loss, with the result that death may result from blood loss associated with normal delivery. Forty percent of all maternal perinatal deaths are linked to anaemia. Favourable pregnancy outcomes occur 30-45% less often in anaemic mothers, and their infants have less than one-half of normal iron reserves. Such infants require more iron than is supplied by breast milk, at an earlier age than, than do infants of normal birth weight.

Though the state of Himachal Pradesh has made significant progress in the health front but the nutritional status of adolescent girls is poor as indicated by NFHS survey. In Himachal Pradesh not much work has been done on anaemia in adolescent population, hence the

present exercise is an attempt to find out prevalence of anaemia among school going adolescent girls and to correlate the associated socio-demographic factors. An attempt was also made to assess the knowledge of the adolescent girls about anaemia.

AIMS & OBJECTIVES

To assess the knowledge of anaemia amongst the study subjects.

II. METHODS AND MATERIAL

Study Population: The present Cross sectional study was carried out amongst school going adolescent girls studying in 6^{th} – 12^{th} classes in the government schools located in rural & urban field practice areas of Department of Community Medicine, Indira Gandhi Medical College, Shimla. WHO has defined adolescence as period of life between 10-19 years of age, therefore girls falling in this age group were taken in the study.

Definition of Anaemia for the purpose of study : WHO has defined the thresholds below which person is said to be anaemic.

Age group	Haemoglobin below	
	g/l	mol/l
Children 5-11 years	115	7.13
Children 12-14 years	120	7.45
Non-pregnant women	110	6.83

Sample Size: In this study, sample size to be studied has been calculated taking into consideration prevalence of 50% & with allowable error of 10%. Sample size is as under.

$n = 4pq/L^2$

n=Sample size

p=prevalence ie 50%

q=100-p ie 50%

Allowable error L=10% of prevalence

N=4x 50 x 50/10% of 50

= 400.00

Thus a sample of 421 subjects was studied. Outs of those 209 were studied in the urban & 212 subjects were taken from rural area.

Study Duration: Study was conducted for a period of one year.

Sampling: To start with all the government senior secondary schools falling in the field practice areas were listed. One school from each area (urban/rural) was selected randomly & permission from the Head of the Institution was taken to conduct the study. Number of subjects was selected proportionate to the total strength of the girl students in each school by systematic random sampling technique. A total of 421 girl students from rural & urban areas were selected. The selected students were given consent forms in advance to obtain the consent of parents/guardian for participation in the study. History, general physical examination & clinical examination were done and noted on pre designed & pre tested proformas. This was followed by collection of blood samples. In the end proformas were analyzed using standard statistical methods (Epi Info/Excel).

Investigation: Blood samples (20µl) were collected by prick method from ring finger of individuals using standardised pipette on Whitman filter paper no.1 after recording particulars on each filter paper, these were dried & placed in individual envelopes. Haemoglobin levels were estimated by colorimeter using cyanmethaemoglobin technique.

III. RESULT AND DISCUSSION

Table 1

Distribution of study population according to mother's educational qualification and anaemia

Mother's qualification	No. of anaemics	Non anaemics	Total
Up to Primary	119 (56%)	95	214
Primary to higher sec	108 (56%)	86	194
Graduate & above	8 (54%)	5	13
Total	235 (56%)	186	421

Chi sq = 0.18, p value >0.05, df =2

Table 1 shows that where mother was graduate and above there is decrease in the prevalence of the anaemia, but the results were not found to be statistically significant.

Table 2

Distribution of study population according to their knowledge about anaemia

	Total	No. of anaemics	Non anaemics
No. of girls who knew about anaemia	137	78 (57%)	59
No. of girls who did not knew about anaemia	284	156 (55%)	128

Chi sq = 0.15, df 1, p value > 0.05.

Table 2 shows there was no significant association between knowledge about anaemia and its occurrence.

Table 3

Distribution of study subjects as per their knowledge of the sources of iron rich food.

Source	No.	No. of anaemics	Non anaemics
Green leafy vegetable	257	146 (57%)	111(43%)
Non vegetarian diet	25	11 (44%)	14(56%)
Pulses	3	31 (100%)	0
Fruit	18	8 (44%)	10(56%)
Others	16	14 (88%)	2(12%)
Do not know	102	53 (52%)	49(48%)

Table 3 shows the percentage of anaemics in subjects with respect to the answer given. Girls who knew about non-vegetarian food and fruits to be good source of iron were less likely to be anaemic.

Table 4

Distribution of the study subjects as per their knowledge about the period in life when there is greatest requirement of iron.

Period of life for increased requirement of iron	Respon ses	No. of anaemics	Non anaemics
Childhood	147	81 (55%)	67(45%)
Adolescenc e	166	95 (57%)	71(43%)
Adults	57	34 (60%)	23(40%)
Do not know	51	26 (49%)	25(51%)

Chi sq = 0.19, df = 2, p value > 0.05

Table 4 shows 166 girls knew that the adolescents require maximum amount of iron in their diet but it was not being practiced by them.

Table 5

Distribution of study population as per their knowledge of the effect of anaemia on academic performance

Opinion	Respon ses	No. of anaemics	Non anaemics
Affects academic performance	106	50 (47%)	56(53%)
Does not affects academic performance	265	152 (57%)	113(43%)
Do not know	50	33 (66%)	17(34%)
	315	185 (59%)	130 (41%)

Chi sq = 4.30, df = 1, p value < 0.05

Table 5 shows that girls who had knowledge about the effect of anaemia on academic performance, were less likely to be anaemic.

Table 6

Distribution of study population as per their knowledge of more requirement of iron by Boys/girls.

Opinion	Respo nse	No. of anaemics	Non anaemi c
Girls require more iron	60	40 (50%)	20(33 %)
Boys require more iron	307	174 (54%)	133(43 %)
Equal	16	9 (56%)	7(44%)
Do not know	38	12 (32%)	26(68 %)

Chi sq = 12.01, df = 3, p value < 0.01.

Table 6 shows that the prevalence of anaemia was lesser in the girls who knew that they need more iron as compared to the boys.

Table 7

Distribution of study subjects as per the action they would take on being told to be anaemic.

	Respo nse	No. of anaemics	Non anaemics
Will start taking iron rich diet	36	24 (67%)	12(33%)
Will do nothing, even if told to be anaemic	40	20 (50%)	20(50%)
Inappropriate action (Total)	76	44 (58%)	32(42%)
Will take doctor's advice if told to be anaemic	345	191(55%)	154(45%)

Chi sq =0.16, df = 1, p value >0.05

Table 7 shows that right knowledge of the subjects about the action to be taken in the event they are found to be anaemic, was not statistically significant to prevent them from anaemia.

Knowledge, Practice & Attitude regarding anaemia:

Knowledge is one of the factors required to promote health in order for people to control over and to improve their health. As promulgated in the Ottawa charter (WHO, 1986) the others include building healthy public policy, creating a supportive environment, strengthening community action and reorienting health services. In our study, assessment of the subjects, regarding knowledge, practice & attitude in relation to anaemia & its prevention was also taken.

It is a known fact that dietary intake of food such as meat, vegetables and fruit rich in iron are important in the prevention of anaemia. Accordingly in our study, it was seen that the girls who had knowledge about sources of iron rich diet, had lesser prevalence of anaemia. (Chi sq = 29.25, p value < 0.01, df 1)

Also prevalence of anaemia was lesser in the girls who knew that they need more iron as compared to the boys. (Chi sq = 12.01, df = 3, p value < 0.01).

In our study prevalence of anaemia was least in the girls who were taking non-vegetarian diet twice weekly, but the results were not statistically significant. Reason for not appreciable effect of non–vegetarian diet on anaemia prevalence, could be too little amount or quite infrequent use of non- veg diet. In our study 371(88%) of the subjects had never taken non vegetarian diet, 14 (3%) girls have taken occasionally (once/twice a year), while 36(9%) take non- vegetarian diet twice weekly. So we can see in our study, the reason for statistically not significant result could be, the very small number of subjects who were taking non vegetarian (i.e. atleast twice weekly and in very little amount).

Parent's Educational Qualification & anaemia

It was observed that when mother was a graduate and above there is decrease in the prevalence of anaemia, but the result when analysed statistically, was found to be insignificant. The reason for such a finding could be that the mother's knowledge specific to anaemia would have made significant difference than formal qualification.

DISCUSSION:

In the 1830s, anaemia, hypochromia and lack of iron in the blood were detected by Fowler **[1]** and Ashwell was able to classify chlorosis as a disease of the blood **[2].** In 1832, Pierre Blaud, described the response of chlorosis to his deservedly famous pills (ferrous sulphate plus potassium carbonate). He gave gradually increasing doses, from 2 pills on the first day to 12 pills on day 16. Many observers, including Haden RL, confirmed his findings **[3].**

Iron deficiency is one of the most common, but not the only cause of anaemia other causes of anaemia include chronic infections, particularly malaria, hereditary haemoglobinopathies and other micronutrient deficiencies, particularly folic acid deficiency. It is worth noting that multiple causes of anaemia can coexist in an individual or in a population and contribute to the severity of the anaemia.

Over half of the pregnant women in world have haemoglobin level indicative of anaemia: 52% in non-industrialized-as compared with 23% in industrialised countries.

In Africa **[4]** as a whole, one half of all pregnant women are anaemic, as are over 40% of non-pregnant women are anaemic, Western Africa is the most affected, and southern Africa the least. The prevalence there is estimated to be 56% for pregnant and 47% for non-pregnant women. Southern Africa, on the other hand, has the lowest rates of all the sub-regions of the developing world due, according to some observers, to the widespread use of iron cooking pots by indigenous people. The remaining region of the Africa has a fairly uniform prevalence of between 47% and 54% for pregnant women and 41% and 43% for non-pregnant women.

In a Delhi hospital based comparative study conducted by Ajmani *et al* **[5]** in 1972 mean Hb was found to be 4.48± 0.6 and 13.1± 0.4 respectively in anaemic & normal subjects.

Rana *et al* **[6]**conducted a study at Hyderabad in Andhra Pradesh by enrolling 697 urban girls in the age group of 9-16 years found mean Hb to be 11.23± 0.18, 11.36± 0.13, and 11.05± 0.17 in the age group <12, 12-13, >13 years respectively.

Another study was conducted at Maharashtra; Chembur, Bombay; in 1990 by Tumbi & Dodd **[7].** In the study 80 subjects (apparently healthy and menstruating) were enrolled from low middle income group of a housing society in a suburban area. They found that 60% of the subjects had Hb level <12 g/dl and were anaemic in mild to moderate range.

In 1993, Yegammai & Gandhimathy **[8]** conducted an urban school based study at Coimbatore in Tamil Nadu. By random sampling 180 subjects were taken for initial screening & 120 out of the 180 – for supplementation trial. About 83% of the girls were anaemic (Hb<11 g/dl). Mean Hb level was 7.9 ±0.3 g/dl. The mean serum iron level of 62.8 to 66.0 µg/dl was found, which was less than the normal value of 70µg/dl.

Kanani *et al* **[9]** 1998 enrolled 203, 10-18 years old girls from slums of Vadodra, Gujarat. Hb estimation was done by cyanmethaemaglobin method. Overall 83.0% of the girls were found to be anaemic.

In another school based study by Kanani *et al* **[10]** at Vadodra, Gujarat, prevalence of anaemia was 75.0%. A total of 1517 adolescent girls were enrolled and estimation of iron was done by cyanmethaglobin method.

Another cross- sectional study **[11]** was done by enrolling 278; 12-18 years old adolescents from rural schools at Faridabad, Haryana. In age group 12-14 years old girls, prevalence of anaemia was 51.5%, while in the age group of 15-16 years old girls anaemia was found to be present in 38.5% of cases.

Chakravarty & Ghosh **[12]** in 2000 conducted a rural community based study by enrolling 12-19 years old girls. Multistage sampling technique was used. Prevalence of mil and moderate anaemia was high ie 65.8% in boys & 81.3% in girls. In this group, 3.8% boys & 6.0% girls had severe anaemia.

Another study (Rawat *et al*) **[13]** at field practice area of LLRM Medical College in Daurala block, Meerut in U.P. studied a cross section of 504 adolescent girls in the age group 10-18 years. They observed that the overall prevalence of anaemia was 34.5% with 19.0%, 14.0% & 1.4% showing mild, moderate, & severe anaemia respectively.

In a community based study **[14]** conducted at Ahmedabad among girls of school going age (6-180) residing in 15 slums of the city, it was found that majority (81.8%) of girls were anaemic. The overall prevalence of mild, moderate and severe anemia was 55.2%, 26%, and 0.6% respectively. It was significantly higher among girls whose fathers were working as semi-skilled/skilled workers (77%) (P<0.02) and those having BMI more than 18.5 (79.7%). The prevalence of anaemia was observed lower in girls consuming green vegetables (P<0.01).

In the study sponsored by Mother Care project, USAID **[15],** Raina *et al*. documented a prevalence of 85.3% (Hb <11 g/dl) in rural Haryana.

In these adolescent girls, the mother to be, who will usher the next generation, pregnancy only serves to aggravate their pre-existing anaemia. Under the circumstances the need to combat anaemia in adolescent girls had been suggested by Nutrition

Foundation of India **[16].** Preventing foetal brain damage due to maternal anaemia in early pregnancy **[17]** support a strategy that ensures that women have a satisfactory haemoglobin status (11g/dl as recommended by WHO even at the beginning of conception.

IV. CONCLUSION

The study was conducted in the urban & rural field practice areas attached to the Department of Community Medicine, IGMC, Shimla during Jan 2005-2006. A sample of 421 subjects (212 rural and 209 urban) were studied. Out of these 235 (55.34%) girls were found to be anaemic.

Girls who were aware about sources of iron rich diet, adverse effect of anaemia on academic performance and increased requirement of iron by the girls were less likely to be anaemic.

Most of the girls knew about the need for increased amount of iron in the adolescent age group, but still most of them were anaemic, the reason could be that the girls are not actual decision makers in deciding about the meals.

1. So it is recommended that Schools can develop the environment, motivation, service and support necessary to contribute to the integrated promotion of health behaviour, which can be a lifelong asset.
2. Imparting health education, specific to anaemia-prevention, to school students and community in general.
3. Nutrition awareness and education are particularly important given adolescents' poor knowledge of anemia, diet and health generally and of iron-rich foods specifically.
4. Channels for reaching youth include: Educational settings Health facilities Community outreach, Media and public information.
5. In practice, nutritional education can be addressed within any setting or program that deals with reproductive and other health issues.

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