International Scholars Journals

African Journal of Medical Case Reports Vol. 8 (9), pp. 001-004, September, 2020. Available online at www.internationalscholarsjournals.org © International Scholars Journals

Full Length Research Paper

Prevalence of anemia in school children

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Accepted 13 February, 2020

The aim of this Cross sectional study was to assess the prevalence of anemia in school children. Two hundred school children within the ages of 5 to 16 years from Government School of Rishikesh, Uttrakhand, India were subjected to relevant history, complete physical examination, hemoglobin estimation and general blood picture gastric bypass procedures (GBP). Anemia was seen in 56.5% cases. More menarcheal girls were anemic (36.5%). The most common blood picture was microcytic hypochromic, and this could be due to lack nutrient. In present study, lower socioeconomic classes, vegetarians and girls children were more anemic as compared to their opposite groups.

Key words: Anemia, Worm infestation, Iron deficiency.

INTRODUCTION

Anemia is a very common problem in pediatric age group in many developing countries with an estimated prevalence of 43% (Seshadri, 1997). In preschool and school children, an estimated 2 billion people worldwide are affected with anemia. Young people are more vulnerable to this disease due to their rapid growth need of high iron. Therefore, it is a critical health concern because it affects growth and physical performance. It has also been associated with functional abnormalities of lymphocytes and neutrophils (Vijayaraghavan et al., 1990; Verma et al., 1998). India is an economically poor country. Although school children constitute 20.25% of total population in India but data are even more limited on younger children. The present study was carried out to assess the prevalence of anemia among urban school children of the Rishiksh City.

SUBJECTS AND METHODS

The study was conducted using two hundred children aged 5 to16 years, studying in the Government school at Rishikesh. The children used in this study are from different socio-economic background and are in classes 1 to 8. The status was assessed by the questionnaire with the help of parent. The period of study was from January 2010 to March 2010.

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The data regarding socio-economic status, nutritional status and dietary habit was collated with the help of junior residents and school teachers. The Performa also included information on the known medical problems of child if any. All children were weighed and taken as under nourished according to Indian Academy of Pediatrics criteria. All children were examined for pallor clinically as seen from palpebral conjunctiva, lips, tongue, skin and nail beds. All children were also examined clinically thoroughly for the evidence of any disease. Blood was drawn by venepuncture in EDTA vials. Hemoglobin (Hb) estimation was done using cynmethemoglobin methods. Anemia was diagnosed when hemoglobin was less than 11 g/dl for children below 6 years and less than 12 g/dl for more than 6 years (Ghai, 2000). Peripheral blood film was prepared by using leishman's stain. The red blood cell (RBC) morphology was studied. Routine examination of stool and urine were also done to find out etiology.

RESULTS

Out of 200 school children used in this study, 56.5% (113) were found to be anemic. A significantly higher number of girls were anemic at all age (66.6%) (Table 1). A higher (36.5%) proportion of menarcheal girls had anemia. At almost all ages significantly more (65.2%) vegetarian children were anemic. Hemoglobin showed a rising trend with improved socio-economic status. Most (90.90%) of the children belonging to lower socio-economic groups were anemic (Table 2).

The striking finding was that 37.5% children of upper and upper middle class were anemic. The prevalence of

Table 1. Age/Sex wise distribution.

Age/Sex	Male	Female	Total
5-8	17	14	31 (15.5%)
9-12	51	45	96 (48%)
13-16	38	35	73 (36.5%)
Total	106 (53%)	94 (47%)	200

Table 2. General observation.

Total anemia patient	113 (56.5%)
Girls	73 (66.6%)
Menarche girls	36.5%
Boys	040 (33.4%)

Table 3. Dietary habit/anemia.

Dietary habit		Anemia
Vegetarian	115	75 (65.2%)
Non vegetarian	85	38 (44.7%)
Total	200	113

Table 4. G.B.P. wise anemia.

Type of anemia	Total no./% n = 113 anemic children
Microcytic hypochromic	62 (54.86%)
Normocytic normochromic	48 (42.47%)
Dimorphic	03 (02.54%)

Table 5. Etiology.

Etiology	Total no./% n=113
Nutritional	55 (48.67%)
Worm Infestation	20 (17.69%)
others	38 (33.62%)

anemia was high (66.89%) in the undernourished children, whereas nearly 1/3 (29.09%) were anemic in the well nourished group. Even the mean Hb of both these groups was lower than the world health organization (WHO) standards of the age.

Clinical pallor was detected in 42% of total children while 56.5% were anemic as per hemoglobin estimation. The commonest blood picture was microcytic hypochromic seen in 54.86% (62) followed by normocytic normochromic in 42.47% (48) and dimorphic picture was seen in 2.54% (03) only (Table 3). 5 to 7 years mainly had microcytic hypo chromic anemia. The most common cause could be nutritional 48.67% (55), followed by different worm infestation in 17.69% (20) only. Other cause could be chronic illness, acute gastroenteritis, pneumonia and giardiasis (Tables 4 to 6).

DISCUSSION

Anemia is defined as hemoglobin concentration of less than 11 to 12 gm% per age. It is further categorized as mild (10 to 11 gm %), moderate (7 to 9.9 gm %) and severe (7 gm %) (Kwiatkowski, 1999). Occurrence of anemia in undernourished children and those belonging to poor socio-economic status is a well documented fact

Table 6. Correlation of age with mean hemoglobin.

Age in year	Sex	Hb g/dl mean	+
5	M = 5	10.26	0.95
n = 9	F = 4	10.05	0.79
6	M = 5	09.90	1.06
n = 11	F = 6	09.78	1.12
7	M = 2	10.23	0.70
n = 3	F = 1	10.15	0.49
8	M = 5	10.25	0.89
n = 8	F = 3	10.28	0.75
9	M=4	11.05	1.40
n = 7	F = 3	10.87	0.99
10	M=21	11.26	1.38
n = 40	F=19	11.57	1.27
11	M = 8	12.24	1.36
n = 17	F = 9	12.21	1.12
12	M=18	12.43	1.47
n = 32	F=14	12.21	1.17
13	M=12	12.28	1.36
n = 20	F = 8	12.03	1.12
14	M=10	12.62	1.08
n = 19	F = 9	10.38	1.12
15	M=12	11.26	1.35
n = 22	F=10	10.25	0.73
16	M = 4	12.83	1.31
n = 12	F = 8	10.23	0.93

(Desai, 1993). The present study showed high prevalence of anemia among school children of upper and upper middle social economic status (37.5%). More than half (56.5%) children were anemic and 1/3 of (29.09%) children in well-nourished group had anemia. Iron deficiency anemia was noted in 48.67% of the children studied.

In view of these findings, it is evident that a significant proportion of the apparently healthy children suffer from overt anemia and they have latent iron deficiency. The possible reason for this could be the rising trend of consuming snacks and junk foods in all the socio-economic status.

Iron deficiency anemia is the most wide spread micronutrient deficiency in the world, it affects nearly 2000 million persons of which 90% are in developing countries (Maeyer et al., 1989). In Indian subcontinent, the prevalance of IDA ranges from 38.72% depending upon age and sex. In children it is estimated to be 40 to 53% (Oski, 1993).

Girls had a higher prevalence rate; more menarcheal girls were anemic as compared to non-menarcheal girls. Early adolescence is a critical period for developing anemia in girls and boys due to growth spurt. A survey of 12 of 18 year old girls found an anemia prevalance rate of 82.9% among girls in school and 92.7% among girls that are not in school (Vasanthi et al., 1994).

The present study highlights that anemia is a major

health problem among school children. Thus prevention of anemia in this age group is an urgent need for improving intelligence quotient (IQ) test of children because there are studies to suggest that children with anemia specially iron deficiency are at high risk of long term impairment in mental and motor development. They also suffer from lower score in I.Q. tests (Lozoff et al., 1991), lack of concentration, short attention span and easy distractibility, which eventually result in school dropouts. Anemias also adversely affect immune system thus increasing the susceptibility to infection and poor physical fitness.

Therefore, routine iron supplementation for reduction of iron deficiency should receive top priority for mid day meal programmes in schools and awareness of parents. This will require a multi lateral approach with better utilization of health infrastructure through proper planning and a general awareness of its urgency at all level.

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