Original Article

Prevalence of anaemia among young girls and pregnant women of Birgunj, Nepal

M. Adak , S. Nazri

Department of Biochemistry, National Medical College and Teaching Hospital, Birgunj,

Correspondence to: Manoranjan Adak, Department of Biochemistry, National Medical College and Teaching Hospital, Birgunj,

e- mail: manoranjanadak@rediffmail.com, mradak1962@yahoo.co.in

Background. The prevalence of anaemia is a major health problem worldwide and is high particularly among young girls and pregnant women. A perusal of the literature on anaemia prevalence in semi urban areas of Nepal is very alarming and its magnitude increases day to day.

Methods: All the patients with illness attending at OPD of NMC Hospital were included in the study. Social demographic profile, morbidity data were recorded on a structured questionnaire. Anthropometric measurements and BMI were recorded on the basis of National Health and Nutritional Examination Survey. Hb was estimated by Sahli's method and pregnancies were verified with urine specimen using on HCG testing kit.

Results. In the sample of 552 patients, 54-64.2 % were anaemic .Out of which, 26.9 % of pregnant women were moderately anaemic and 3.1 % subject were severe anaemic.

Conclusions. Higher prevalence of anaemia among young in Birgunj was alarming looking due to either lesser consumption of green leafy vegetable or habit of post meal tea/coffee drinking or smaller intake of citrus fruits. These findings suggest that guideline for screening for anaemia may need to further study in relation to the dietary level of iron, iron and ferritin level in blood.

Key words: Anaemia, young grils, pregnant women, semi urban areas

Introduction

Anaemia is widely prevalent in developing countries and affects both sexes in all age group[1]. Among these developing country, like South East Asia has the highest prevalence of anaemia[2]. Iron deficiency anaemia is the most common and nearly 1.3 billion people are affected by nutritional anaemia[3] .The prevalence of iron deficiency anaemia in advance countries is about 36-40% whereas it is only 8-10% in developed countries [4]. Most of the women are suffering from anaemia during reproductive age and its magnitude increases in pregnancy [5]. The prevalence of anaemia among Nepalese both in adolescent girls and pregnant women was 42% [6] .

Anaemia is characterized by either a reduction in the number of erythrocyte cells per unit of blood volume or decrease in Hb content of blood. The maximum possible causes for anaemia are lack of nutrients principally iron, vit-B_{12}, and folic acid etc. Other factors may contribute to iron deficiency anaemia like inadequate intake or defective absorption of iron [7],chronic blood loss [8] and hook worm infestations [9] etc.

Young girls are the major segment of its population and constitute a vulnerable group on account of the practice of early marriages and potential exposure to a greater risk of morbidity and mortality [10]. There is also evidence that severe anaemia among pregnant women places them at increased risk of mortality[11]. The present study was designed to assess the prevalence of anaemia among young girls and pregnant women residing in Birgunj, Nepal.

Material and Methods

A total of 552 clinically suspected patients with fever, skin disease, diarrhea, infection and pregnancy etc. attending at out patients department (OPD) of National Medical College and Teaching Hospital were included in the study. The present study was carried out among girls attending OPD

by the following heads: school going girls (6-9 y) age, pre-adolescent girls (10-12 y) age, adolescent girls (13-19 y) age and pregnant women (20-39 y) age.

Demographic profile including education, food habit and diet consumed were recorded on a structured questionnaire. Nutritional status was evaluated using WHO recommendation [12]. The anthropometric measurements (weight and height) were recorded and body mass index, BMI (weight/ height ^{2}) were calculated on the basis of National Health and Nutritional Examination Survey [13].

Morbidity data were collected by asking questions under the subheading namely typhoid, diarrhea, skin disease, intestinal worms infestation, respiratory infection, ear infection, pyrexia and other. Blood samples were collected from the individual and Hb was by the conventional method of Sahli's. Pregnancies were verified with urine specimen using on HCG testing Kit (Span diagnostic).

Results

Descriptive characteristics of young girls and pregnant women enrolled in the OPD of NMC hospital of Birgunj, Nepal are given in Table –I. About 20-35% people of Birgunj are literate. The occupation of earning member of all groups of patients was noticed as semi-skilled worker (35-45%) when compared with skilled worker and businessmen. About 40% pregnant women having habit of post meal consumption of either tea or coffee. The consumption of green leafy vegetable as supporting nutrients were varies from 32-39 %. On closer look reveal, the maximum percentage of green leafy vegetable were consumed by pregnant women. Intake of citrus fruit were maximum (35%) in the pre- adolescent.

Results from Fig- I a clear knowledge comes out about the level of education among the family members principally the father's education. 52% fathers are illiterate and near about 45% has up to primary level education. Higher secondary and graduation was recorded only 25% and 13% respectively.

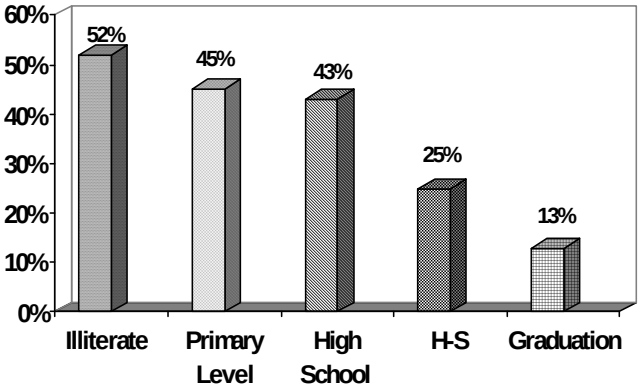

Fig. 1 : Father's educational status of all age groups

Nutritional status of all studied groups were insufficient and only 20 % population have adequate nutrition, results given on *Fig-II.*

Table 1: Descriptive characteristics of young girls and pregnant women .

Characteristics	School going girls n=112	Pre-adolescent girlsn=114	Adolescent girls n=200	Pregnant women n=126
Age	6-9 years	10-12 years	13-19 years	20-39 years
Education	33%	35%	27%	22%
Occupation of father:Skilled				
Semi-skilled				
Business	20%	22%	31%	35%
Habit of post meal consumption				
of Tea/coffee		8%	28%	40%
Consumption of green leafy				
vegetables	32%	38%	35%	39%
Citrus fruits	32%	35%	31%	30%

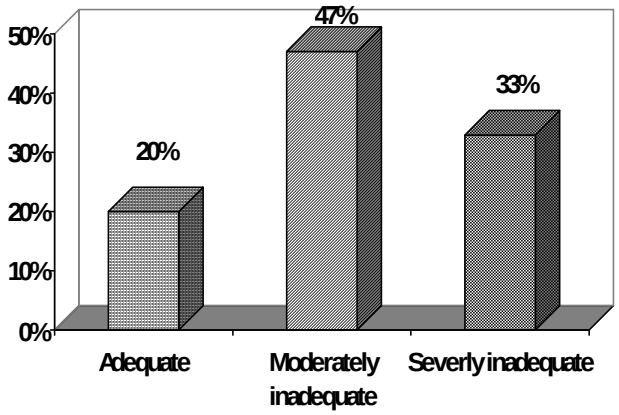

Fig. 2: Nutritional status of all age groups.

Prevalence data for all anaemia were present for school going girls , pre-adolescent girls, adolescent girls and pregnant women in Table –II .Using the 1992 FAO /WHO cut-off level (Hb > 120 g/L as normal)[14] .It was found 54-64.2 % subject were anaemic.Out of which , 26.9% of pregnant women were moderately anaemic and 3.1% were severe anaemic.

As depicted in Fig.-IV, 80% reported various types of morbidities such as typhoid, diarrhea, skin diseases, worm infestation respiratory infection, ear infection, pyrexia, and other. Skin diseases topped the list of the morbidities (31.5%) and the second highest (27.8%) morbidities was worm infestation while 25.2% respiratory infection.

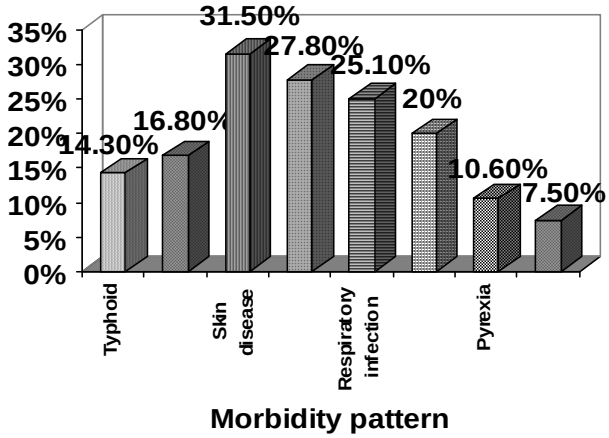

Fig. 4: Comparative study of morbidity of all age groups.

Table 2: Prevalence of degrees of anaemia in school going girls, pre-adolescent girls , adolescent girls and pregnant women.

Subjects	Prevalence of degrees of anaemia								Mean Hb±SD	p value
	Normal Hb >120 g/L		Mild Hb 100-119 g/L		Moderate Hb 75-98 g/L		Severe Hb <70 g/L			
	N	%	N	%	N	%	N	%		
School going girls	23	20.5	72	64.2	16	1.4	1	0.8	10.86±2.03	< 0.05
Pre–adolescent girls	21	18.4	68	59.6	24	21.05	1	0.8	10.80±1.84	<0.05
Adolescent girls	44	22	108	54	45	22.5	3	1.5	10.68±1.60	< 0.05
Pregnant women	16	12.6	72	57.1	34	26.9	4	3.1	10.63±1.62	<0.05

The average BMI decreases in each group and most interesting observation was that the maximum change of BMI values were noticed in pregnant women(20-39 Y) age group *(Fig. 3).*

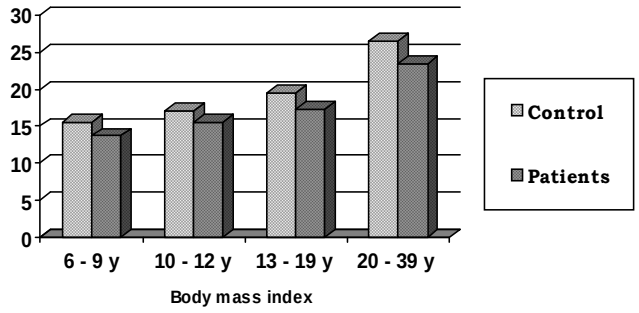

Fig. 3: Comparative studies of BMI of all age groups

Discussion

Five hundred and fifty two patients of different age groups from out patients department of NMC were selected for the study of anaemia in Birgunj Nepal. In a study, investigating whether haemoglobin level in blood should be adjusted for educational status, nutritional status, food habits and body mass index. These subjects belonged primarily to lower socio – economic groups, the average income of the families of these subjects being Rupees. 1000 – 1200 per month which is not adequate even to have a balanced diet for an average family. Using data on a large, we found that educational status and nutritional status of a individual group of patients was very poor. We have also noticed that 51 % of patient's father were illiterate and their occupation were semi-skilled. These findings are consistent with the results of low level

Hb in blood, due to either a insufficient /lack of knowledge of anaemia or low income which was not enough to maintained the daily requirement of common food.

Nutritional anaemia though global in occurrences, is more of concern in developing countries like Nepal and the prevalence of anaemia in urban adolescent girls aged 13-19 year was found to be about 68.8% [14]. These study is also corroborate our findings and clearly indicated 20% population having adequate nutrition, Other workers also reported that a similar findings in India too, the problem of malnutrition anaemia exist in greater dimension among the young children[15].

In our study, the prevalence of anaemia in school going girls where majority were from low-income group was 64.2%. Whereas in pre-adolescent and adolescent girls the prevalence of anaemia was 59.6% and 54 % respectively .The prevalence of moderate anaemia among pre-adolescent and adolescent girls was 21.05% and 22.5 % with Hb range of 75 – 98 g /L. Both mild and moderate prevalence of anaemia in pregnant women was 57 % and 26.9 % respectively. By considering FAO/WHO guidance [14] the cut-off level of Hb less than 70g/L, 3.1% pregnant women was severely anaemic and all values were statistically significant ($p< 0.05$). Higher prevalence of anaemia among the girls of Birgunj was most common clinical problem due to (a) lesser consumption of green leafy vegetables which supported the lower availability of dietary iron[16], (b) habit of post meal tea/coffee drinking that indicated the dietary absorption of iron was inhibited by the tannin contents of tea/coffee [17] and (c) smaller intake of citrus fruits which reduce the iron absorption due to decreased amount of ascorbic acid in citrus fruits [18] .The association of anaemia and BMI as seen in the present study is also well established [19] .

Adolescent phase is a crucial developmental period and with a inadequate/improper dietary habits, one is vulnerable to all kind of nutritional morbidities. However, 80% of the subjects in this study reported one or other type of morbidities: skin disease (31.5 %), worm infection (27.8 %) , acute respiratory infection (25.1 %) , diarrhea (16.8 %) , ear infection (20 %) and typhoid (14.3%). Even considering that self-reported morbidities may tend to overestimate or underestimate the actual incidence and may not match with clinical diagnosis [20] . These definitely need to be correlate with clinical investigation. Morbidities studies was carried out in Cameroon [21], Equador [22] and Phillippineo- Mindana [23] and Nepal [24] and we observed that our results was similar to reported values . From our present study, we may come to conclusion that a high prevalence of anaemia among school going girls, pre-adolescent girls, adolescent girls and pregnant women was alarming looking to the grave consequences of anaemia. The association of anaemia with various risk factors is also established by now. Further study is essential for prevalence of anaemia in Birgunj in relation to the dietary level of iron, total iron in blood and ferritin level in blood. Works are going in this direction and to be present elsewhere.

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