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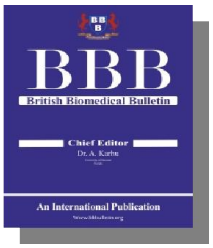
BRITISH BIOMEDICAL BULLETIN



Original

Prevalence of Nutritional Anemia in Primary School Children in Urban Slums Areas of Hyderabad, Andhra Pradesh, India

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A R T I C L E I N F O

Received 20 Jan. 2014
Received in revised form 22 Jan. 2014
Accepted 27 Jan. 2014

Keywords:
Malnutrition,
Underweight,
Anemia,
Pallor.

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A B S T R A C T

Objectives: To estimate the prevalence of Nutritional anemia among primary school children and assess the factors influencing it. **Material and Methods: Study population**: Primary school children (6 to 11 years). **Study Area:** Primary schools in urban slums of Hyderabad. **Study Design:** A cross sectional study. **Sample Size:** 384 children. **Sampling Methods:** Simple random sampling. **Data Collection:** By using pre designed and pre tested and pre coded schedule (interview technique, observation, clinical examination). **Analysis:** By using Microsoft Excel 2007 and Epi Info 3.5.3 **Results:** The prevalence of anemia was 52.7%, underweight was more than 70%. **Conclusion:** The prevalence of anemia was found to higher in children who were underweight and who are from low socioeconomic status.

Introduction

Nutritional anemia is a global problem of immense health significance affecting persons of all age and economic group particularly in children and women.

Nutritional anemia refers to a condition in which the hemoglobin content of the blood is lower than normal as a result of a deficiency of one or more essential nutrients, regardless of the cause of such deficiency.[1]

Anemia is associated with less than optimal behavior in infants and children. Anemia is a nutrition problem worldwide and its prevalence is higher in developing countries when compared to the developed countries.[2,3]

Anemia affects the physical and mental development of an individual leading to decreased working capacity, which in turn affects the development of the country.[4]

The prevalence of anemia in the developing countries tends to be three to four times higher than in the developed countries.[5]

WHO estimates that around two billion people are anemic with approximately 50% of all anemias attributable to iron deficiency.[6] India is among the countries with highest prevalence of anemia in the world.[7]

Anemia, a manifestation of under-nutrition and poor dietary intake of iron is a public health problem, not only among pregnant women, infants and young children but also among adolescents.[8]

In many developing countries, one half all children and adolescents fail to achieve their full genetic growth potential due to the combined effects of inadequate nutrition and frequent illness. Moreover, due to faulty dietary habits, ignorance, and in a country like India, with a multitude of social customs and beliefs cited against women, the prevalence of malnutrition amongst girls remains quite high. Anemia not only affects the present health status, but also has deleterious effects in the future. Learning, cognitive function, and scholastic performance is also severely affected. The rates of low birth weight, pre-maturity, neonatal and infant mortality among children born to undernourished adolescent girls is high. Later on these undernourished girls becomes anemic and produce low birth weight babies.

Aims and Objectives

i) To estimate the prevalence of Nutritional anemia among primary school children.

ii) To assess the factors influencing the anemia in the study population.

Material and methods

Study population

Primary school children (6 to 11 years).

Study Area

Primary schools in Harazpenta, the urban field practice area.

Study Design

A cross sectional study.

Study Variables

Socio-demographic variables (Age, Sex, Religion,) Nutritional status (Height, Weight), socio economic classification was done by Modified kuppuswamy socioeconomic status scale.

Sample Size Calculation

For calculating sample size, the prevalence of Anemia was considered as the most common health problem in primary school age children. Therefore, by taking prevalence of anemia 50%, (Ref: J.H. Abramson, Z.H. Abramson. Survey Methods in Community medicine, fifth edition, page

no., 97) sample size was obtained by using formula

$$\frac{1.96^2 \text{ X P X Q}}{L^2}$$

Where, P = Prevalence, Q=1-P,
L=Precision

Assuming prevalence of malnutrition as 50%, with relative precision of 5 % the sample size is as follows:

$$= \frac{1.96^2 \text{ X } 0.50 \text{ X } 0.50}{0.05^2} = 384 \text{ children}$$

Sampling

The list of the schools (08) was obtained from the Office of the District Educational Officer, Ranga Reddy District. By simple random sampling technique, 04 schools were selected for the study. All Children of both sexes in the age group of 6-11years were covered in these schools.

Inclusion Criteria

Children of age group of 6-11 years. All those who were present on the day of examination.

Exclusion Criteria

Children those who were absent on the day of examination.

Data Collection

By using pre designed and pre tested and pre coded schedule (interview technique, observation, clinical examination). Data collected from a total of 412 children.

Permission of the District Educational officer, Ranga Reddy district was obtained before the initiating the study and permission from head of institution was taken.

Consent

Consent was obtained from the Parent/guardian and class teacher and the principals of the respective schools. They have been explained about the purpose and the need for the study.

Ethical Clearance

Taken from Ethical committee of Osmania medical college, Koti, Hyderabad.

Research Investigator

The investigator himself was principal research investigator. Help of class teacher was taken to record exact date of birth of the student, religion, caste, parent's education and occupation.

The following criteria and standard were followed in the assessment of school children**:**

A). Anthropometry

The following parameters have used for the assessment of nutritional status.

a) Height, b) Weight, c) Body mass index (BMI)

These were measured as follows:

Height recording

Height was measured by using stadiometer. Standing height was measured (to 0.5cms.) with height measuring rod, without shoes, the child standing erect and looking straight so that the inferior orbital margin and the tragus of the ear fall in a horizontal plane parallel to the ground. This process was repeated thrice and the consistent findings were recorded.

Weight

A electronic weighing scale, was used to measure the weight in kilograms. The scale was calibrated. Zero error was checked, children were without shoes, in shirt and trousers or skirt. The weighing machine was placed on a firm and flat ground. Weight was recorded to the nearest 100 grams. The same balance was used throught the study.

The index of nutritional status that is weight for age, was expressed in standard deviation units (Z scores) from reference median as recommended by WHO.[9]

B). Anemia

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 collected by finger prick and the hemoglobin was determined by cyanmethemoglobin method with the help of trained laboratory technician. In the study[17] this method was used for estimation of blood hemoglobin levels.

As per the WHO recommend-dations[10,11] anemia was diagnosed when Hemoglobin (Hb) was <11 g/dl for children <6 yr and <12 g/dl for ≥ 6 to 14 yr old children. Anemia was further graded as mild (Hb=9.0 - 10.9 g/dl for 5-5.9 yr old and Hb 9.0 - 11.9 g/dl for ≥6 yr old), moderate (Hb = 6.0 -8.9 g/dl) and severe (Hb <6.0 g/dl), same for both age groups of children[12]

Instruments

Weighing machine, Height measu-ring rod, Stethoscope and glove.

Z score by WHO standards were derived by Anthro + package of WHO for nutrition status classification. All tests were considered significant at p< 0.05 level.

Data compilation and analysis

All the data collected was entered and analyzed with MS excel software and Epi info.

Statistical test-percentages, chi square test were used.

Results

Table1. A total of 412 school children had participated in the study. As the age increases enrollment of students is also increased. Female students (56.1%) were more than male children. In the study population 59.7% Hindus, 13.3% were muslims and 26.9% were Christians. It was found that majority of the study population belongs to lower socio economic status.

Table 2.It was found that more than 70% of the study populations were underweight. The prevalence of Anemia was found to be 52.7% among the study population. The clinical feature of anemia like pale conjunctiva was found in 44.4%, pale mucus membrane and pale palmar crease was found in 30.5% and 8.3% respectively. (Table 2)

Table 3.Prevalence of anemia was found b to be higher in female children, which is statistically not significant. The prevalence of anemia was found to higher in children who were underweight which is found to be statistically significant ($p < 0.0001$).

Prevalence of anemia was signi-ficantly higher in the children from lower socioecomic status ($p<0.0001$).

Prevalence of severe anemia was found to be higher in children who had pallor palmar creases ($p<0.001$)

Discussion

It was found that more than 70% of the study population were underweight,. Rachana Bhoite *et al* [13] in their study found the prevalence of underweight was 70%.

In the present prevalence of Anemia was found to be 52.7% among the study population. Study conducted by Anurag Srivastava *et al*[14] found anemia in 37.5% of children**.** Hassan *et al*[15] found anemia in 24.8% of children. Similarly, a study by Gomber *et al*[16,] stated that the prevalence of anemia in school children from urban slums, aged 5–10.9 years was 41.8%.

The clinical feature of anemia like pale conjunctiva was found in 44.4%, pale mucus membrane and pale palmar crease was

found in 30.5% and 8.3% respectively .Neeraj Jain and Vibha Mangal Jain[17] found Clinical pallor in 42% of total children in their study.

Prevalence of anemia was found b to be higher in female children, which is statistically not significant. Neeraj Jain and Vibha Mangal Jain[17] in their study found that Girls had a higher prevalence rate of anemia.

The prevalence of anemia was found to higher in children who were underweight which is found to be statistically significant ($p < 0.0001$).

The prevalence of anemia in study[18] was higher in underweight children when compared to children with normal BMI

Prevalence of anemia was significantly higher in the children from lower socioecomic status ($p<0.0001$).

Study conducted by Deshpande NS *et al*[19] found a very high percentage Anemia in the study population from low socio-economic background.

Prevalence of severe anemia was found to be higher in children who had pale palmar creases ($p<0.001$). If the palmar creases are lighter in color than surrounding skin when hand is hyper extended, the hemoglobin level is usually below 8gms/dl.[20]

So the clinical features like pale conjunctiva, nail beds and pale palmar creases can be used for screening of the children.

Conclusion

In the present study, majority of the school children were underweight and more than 50 % are anemic.

The prevalence of anemia was found to significantly higher among underweight and in children who belongs to low socioeconomic status.

Recommendations

1. A regular health check up should be organized by school authority in coordination of teachers and parents.
2. Health education should be given to the children and parents about nutritional deficiencies.

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Table 1. Socio demographic profile of the study population

Age in years	Frequency (%)
6-7	50(12.1)
7-8	61(14.8)
8-9	91(21.1)
9-10	101(24.5)
10-11	109(26.5)
Sex	
Male	181 (43.9)
Female	231 (56.1)
Religion	
Hindu	246(59.7)
Muslim	55(13.3)
Christian	111(26.9)
Socioeconomic status	
Upper lower class	166(40.3)
Lower class	246(59.7)

Table 2. Nutritional status of the study population

Body mass index	No (%)
Normal weight (> -2Zscore)	123(29.9)
Underweight (< -2Zscore)	289(70.1)
Total number of Anemic children	217(52.7)
Clinical features of anemia	
Pale conjunctiva	183(44.4)
Pale mucus membrane	126(30.5)
Pale palmar creases	34(8.3)
Grading of Anemia	
Mild anemia	37(9.0)
Moderate anemia	147(35.7)
Severe anemia	33(8.0)

Table 3. Factors associated with anemia in study population

sex	Anemia present	Anemia absent
Male (181)	88(48.6)	93(51.4)
Female(231)	129(55.8)	102(44.2)
Total.(412)	217(52.7)	195(47.3)
P value.	0.145	
BMI		
Normal weight(123)	80(65.0)	43(35.0)
Underweight(289)	137(47.4)	152(52.6)
Total.(412)	217(52.7)	195(47.3)
p value	0.0001	
Socioeconomic status		
Upper lower class (166)	70(42.2)	96(57.8)
Lower class(246)	147(59.8)	99(40.2)
Total.(412)	217(52.7)	195(47.3)
p value	0.0001	
Clinical feature		
	Severe anemia	Non severe anemia
Pale palmar creases (34)	18(52.9)	16(47.1)
Normal palmar creases(378)	15(4.0)	363(96.0)
p value	0.0001	