Original Article

Treatable Disease Causing Untreatable Harm: Anemia in school going children

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ABSTRACT

Objective: Prevalence of anemia in Pakistan is high. Magnitude of anemia is well studied in pregnant woman and infants in Pakistan, but we do not have enough data on school age children. The aim of this study was to find the frequency of anemia in apparently healthy primary school age population in Islamabad and its suburban area.

Material and Methods: All children between the ages of 5 and 14 years attending participating non-formulary schools in Islamabad and its suburbs were enrolled in the study. Children attending these schools belong to low to lower middle socioeconomic status. Hemoglobin level was determined in all subjects and a level <11.5 gm/dl was considered as anemia.

Results: A total of 319 children were enrolled. Eighty-seven (27%) children were found to be anemic. Mean hemoglobin concentration was 12.1 gm/dl. There was no significant difference between mean hemoglobin concentrations of males vs. female children.

Conclusion: Anemia is a significant problem in our apparently health school going children of low to lower middle class. We suggest that primary school age children must be screened for anemia and treated. (Rawal Med J 2006;31:)

Key Word: Anemia, school, hemoglobin

INTRODUCTION

Anemia is estimated to effect one half of school age children in developing countries.[1] Its causes are manifold, ranging from nutritional deficiencies which includes iron deficiency (which is the world's largest nutritional problem), [2] B12 and folate deficiency[3] to malaria [4] and chronic inflammatory disorders.[2,5] Pakistan, being a developing country with low GNP and all its associated problems has a high incidence of malaria, chronic infections and nutritional deficiencies all of which are known to cause anemia. Since anemia results not only in physical symptoms such as tachycardia, dizziness, shortness of breath and easy fatigue ability, it is also known to cause cognitive delays and poor achievement scores.[6]

Apparently healthy school going children of lower socio economic statuses in Pakistan are the ones most neglected as far as health care is concerned. Many Southeast Asian countries including India have started iron and folic acid supplementation in target population. Indonesia has covered 60% of its target population via iron and folic acid supplementation.[7] We still have not quantified anemia in our school age population. This study is an attempt to estimate the magnitude of this problem.

MATERIAL AND METHODS

The study was carried out from June to November 2004. All children between the ages of 5-14 years attending participating non-formulary schools in Islamabad and its suburbs were included in the study. These schools are run on non-profit basis and are attended by children from low to low-medium income families. All children received a physical examination. All blood samples were collected in EDTA treated tubes and were transported on ice. Complete Blood Count examination was carried out using SYSMEX- KX hematology analyzer. Commercial controls were tested before each batch and results were analyzed. In accordance with WHO guide lines for this age group, a hemoglobin (Hb) value <11.5 gm/dl was used as cut off for anemia. The severity of anemia was classified as follows: Mild; Hb values

between 9.5 and 11.5, Moderate; Hb values between 7.5 and 9.5, and Severe; Hb of less than 7.5. The ethics committee and Institutional Review Board of Shifa College of Medicine Islamabad approved the study. Consent was obtained from one of the parents on forms approved by ethics committee.

RESULTS

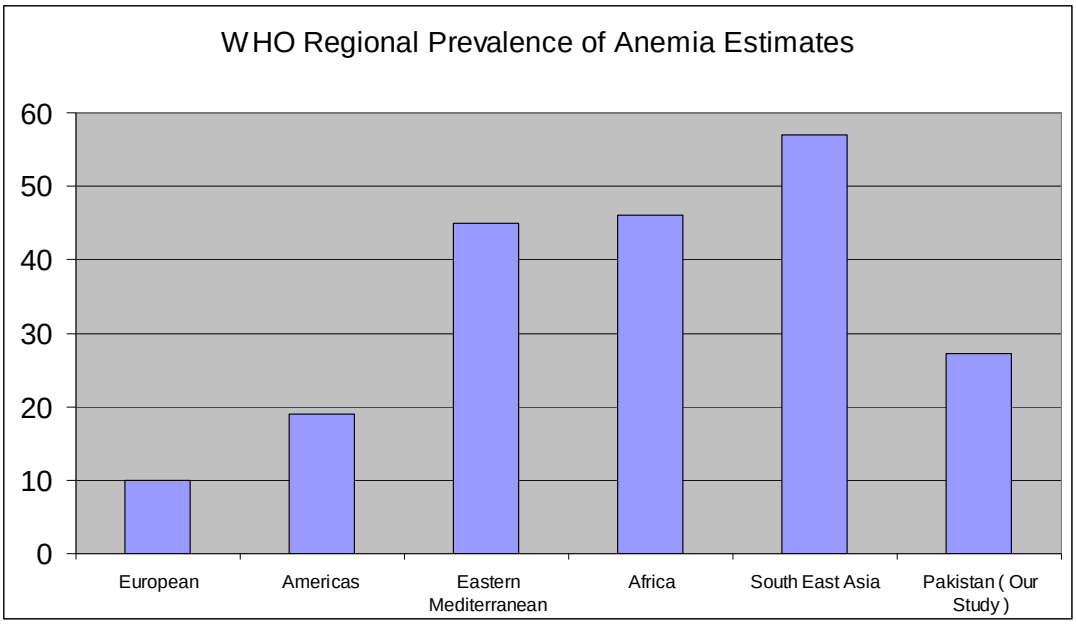
A total of 319 children were included in the study. Mean age was 8.5±2.2 years. Majority of the children (74%) were ten years of age or younger. There were 38% boys and 62% girls in the study. Many girls attending these schools told us that their brothers were attending better (regular) schools. Mean Hb was 11.9±1.3 g/dl (rang 4.3-17 g/dl). Eighty-seven (27.3%) of children had Hb <11.5 g/dl while 232 (72.7%) had >11.6 g/dl.

Table 1. Severity of anemia in different classes.

ANEMIA	FREQUENCY	PERCENTAGE
Mild	66	75.9
Moderate	16	18.4
Severe	5	5.7

Lowest Hb was 4.3 gm/dl. There was no difference between mean hemoglobin across the ages. Minimum mean hemoglobin was found in 13 years olds, which was 11.6 gm/dl. Maximum mean was found in 10 year olds, which were 12.2 gm/dl. None of the children with mild or moderate anemia complained of any symptoms like dizziness or easy fatigue ability. Three children had hemoglobin of less than 6 gm/dl. Two of them gave history of passage of worms in stool.

Fig I: Comparison of frequency of anemia in our study and WHO estimates.



Based on year 1993 population estimates, (United Nations, population division, population projects, The 200 revision)

DISCUSSION

Anemia is estimated to affect 50% of school age children in developing countries.[1] It exerts the heaviest toll in terms of ill health and premature death.[8] School going children is the population most easy to manage in terms of treatment and follow up. Correct estimation however, is essential before any intervention is planned.

Our study of the frequency of anemia in Islamabad and its suburban area is in a relatively under privileged population. In a study from Nawabshah, Sind, iron deficiency anemia was found in 27% of children who attended private clinics in the area for some other health problem.[9]

Table 2. Frequency of anemia in school going children of various countries

Country	***Age group***	***Frequency of anemia***
China[10]	5-14	16.3%
Bangladesh[11]	5-11	31.5%
Ghana[12]	5-14	71.3%
Guinae[13]	5-9	51.7%
Jamaica[14]	5-16	23.5%
Jordan[15]	6-12	15.3%
Panama[16]	5-16	71.3%
Brazil[17]	7-14	41.6%

We found frequency of anemia in our population of 27% was close to that in Bangladesh of 31.5% (table 2). There was no significant difference between anemia prevalence in males and females in this age group in Bangladesh. A study from Brazil also showed no significant difference in anemia between males and females.[17] It is also interesting to note that they did not find a decreased frequency of anemia in children from more affluent regions of Brazil.[17] The frequency of anemia in our study population was found it to be much lower than WHO estimates of anemia in various regions of the world (Fig I).

In conclusion, more than $1/4^{th}$ of our primary school age children of low to middle socio economic status suffer from anemia. Similar studies need to be carried out on larger scale in different socio economic groups to asses the magnitude of this problem in our country.

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