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ORIGINAL RESEARCH ARTICLE

Assessment of Anemia Based on Hb Levels in Children of 2 to 12 Years Age Group in Biratnagar, Nepal

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ABSTRACT

Anemia is the commonest problem in the growing age group in developing countries .When iron deficiency is sufficiently severe, hemoglobin (Hb) concentration in the blood decreases, leading to iron deficiency anemia (IDA) which has negative health consequences, especially in children and adolescents. Hemoglobin levels were used to estimate the incidence of anemia in children of 2-12 years old in the population of Biratnagar, Morang. District, Nepal who attended Biratnagar Hospital & Research Centre, Biratnagar. Out of 5063 subjects, 634 children were selectively diagnosed as anemic. Among 2406 children (aged 2-6 years), 5.4% were diagnosed with mild anemia, 2.7% moderate anemia and 1.7% severe anemia (as per WHO definition). Another 2657 children of 7-12 years age group, 10.2% were diagnosed with mild anaemia, 3.1% moderate anemia and 1.3% severe anemia.

Key words: Iron deficiency, Hemoglobin concentration and Anemia.

INTRODUCTION

Anemia is the commonest problem in the growing age group in developing countries [1, 2]. When iron deficiency is sufficiently severe, Hb concentration in the blood decreases, leading to iron deficiency anaemia (IDA), which has negative health consequences, especially in children [3], adolescents [4].

According to the latest data, more than 3 billion people throughout the world have some form of anaemia ranging from deficiency in iron resources without symptoms of anemia to iron deficiency anemia [5]. Iron deficiency in infancy and adolescence causes mental retardation and damages the immune system, predisposing children to a wide range of disorder [6, 7]. Different studies in Egypt [8], India [9], Thailand [10] and the United states [11] have shown that iron- deficiency anaemia in children under 5 years old and primary school students is accompanied by psychomotor retardation, low intelligence and decreased learning capability. A study in Thailand has shown that the effects of anaemia on intelligence couldn't be compensated for one of the most dangerous consequences is the higher risk of poisoning with heavy elements [10], since the absorption of these elements increases in case of iron deficiency [12]. Recently, it has been reported that pre-school children have the highest prevalence of anaemia, nearly 50% across developing countries, compared with pregnant and non- pregnant women [13].Hence, the present study aim to investigate the incidence of anemia based on Hb levels in children of 2-12 years age group in Biratnagar Hospital & Research Centre, Biratnagar, Morang, Nepal.

MATERIALS AND METHODS

This retrospective study was conducted in Biratnagar Hospital & Research Centre, Biratnagar, Nepal. A sample size of 5063 subjects of both age group (2-6 years and 7-12 years) were investigated for estimation Hb levels. Hb concentration was estimated as per Cyanmethaemoglobin method [11]. As anemia is classified into three degree according to WHO; mild, moderate and severe. Hb cut-off values of anemia for children below 6 years were 10.0-10.9 g/dl (mild), 9.0-9.9 g/dl (moderate) and < 9.0 g/dl (severe). Hb cut- off of anaemia for children 6-12 years old were 11.0-11.9 g/dl (mild), 10.0-10.9 g/dl (moderate) and < 10.0 g/dl (severe) [14].

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RESULTS

(**Table 1**) showed that in our study, out of the total population of 5063 children (including both age group 2-6 years and 7-12 years), 634 children were diagnosed anemic. The total percentage of anemia was 24.4%. Among them, 241 and 393 were from 2-6 years and 7-12 years age group respectively. The incidence of anemia was 9.8% in 2-6 years and 14.6% in 7-12 years children. The overall incidence of anemia was significantly higher in 7-12 years old children (14.6%). Similarly, table 2 showed that status of anemia based on Hb levels measured in 2-6 years old children, severe anaemia was seen in 1.7%, moderate was present in 2.7% and mild was present in 5.4% of children. Overall incidence of anemia was 9.8%. (**Table 2**) also depicts the status of anemia based on haemoglobin (Hb) levels, in children of 7-12 years old. Severe anemia was seen in 1.3%, moderate was present in 3.1%, and mild was present in 10.2% of children. So it is significantly higher than the 2-6 years of children.

Table1: Incidence of anemia in both 2-6 and 7-12 years children

Total No of Investigated Patients	Total Anemic Patients	% of Anemic Patients
5063	634	24.4%

Table 2: Distribution of anemia based on the Hb levels in children aged 2-6 years and 7-12 years.

Age group/ severity of anemia	No of patients	%	Total %
***2-6 years**			
Severe	43	1.7	
Moderate	66	2.7	
Mild	132	5.4	9.8
Total	2406	100.0	
****6-12 years**			
Severe	36	1.3	
Moderate	84	3.1	
Mild	273	10.2	14.6
Total	2657	100.0	

DISCUSSION

Our retrospective study indicates that anemia should be considered as a major health problem in Biratnagar, Morang, Nepal. In total 9.8% of 2-6 year old children and 14.6% of 7-12 year-old children were suffering from anemia (Hb concentration 11.0 g/dl). According to the WHO classification, if 5%-25% of the population having anemia or abnormal Hb, the degree of anemia of the population is graded as mild [7].

A study in the United States (US) in 1976-80 showed the rate of anaemia to be around 6% in 2-6 year-old children [15]. Anemia is present in 27% of 1-6 years old children in Philippines, 27%-44% in 3-5 year- old children in India and 24% in 2-5 year- old children in Romania [16]. Another report showed that Asian children suffer from micronutrient deficiencies, especially iron deficiency and the prevalence of iron- deficiency anaemia was 40-50% in preschool and primary-school children [17]. The World Health Organization has proposed that if the prevalence of anaemia in a region is between 5% and 20%, appropriate interventions based on food diversification, food fortification, iron supplementation and controlling infectious diseases should be considered [7]. Weekly iron supplementation for school children in particular for primary school children has great important to curve the incidence of iron deficiency anemia. Fortification of foods (such as iron fortified biscuits) is another strategy which could be considered for preventing iron deficiency among Nepalese school children.

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REFERENCES

1. De Maeyer E and Adiels-Tegman M The prevalence of anemia in the world. World Health Stat Q, 1985; 38:302-316.
2. WHO U (1998). World Health organization, UNICEF & UNU Iron Deficiency. Indicators for Assessment and Strategies for prevention 1998. World Health Organization: Geneva.
3. Lozoff B, Jimenez E and Wolf AW Long – term developmental outcome of infants with iron deficiency. N Engi J Med, 1991; 325:687-694.
4. Bruner AB, Joffe A, Duggan AK, Casella JF and Brandt J. Randomized study of cognitive effect of iron supplementation in non-anemic iron deficient adolescent girls. Lancet, 1996; 348: 992-996.
5. Michaelson KF. Feeding and nutrition of infants and young children. Copenhagen, World Health Organization Regional Office for Europe, 2000 (WHO European Series, N0. 87)
6. Scrimashaw NS. Functional significance of iron deficiency: an overview. In: Enwonwu CO, ed. Functional significance of iron deficiency. Annual nutrition workshop series, Volume lll. Nashville,

Tenesse, Meharry Medical College, 1990:1-13.
7. Iron deficiency anaemia. Assessment, prevention and control. A guide for programme managers. Geneva, World Health Organization, 2001 (WHO/NHD/01.3).
8. Seshadri S and Gopaldas T. Impact of iron supplementation on cognitive functions in preschool and school aged children: the Indian experience. American journal of clinical nutrition, 1989;50:675S-84S.
9. Soemantri AG. Preliminary finding on iron supplementation and learning achievements of rural Indoesians childrens. American journal of clinical nutrition, 1989; 50:687S-96S.
10. Pollitt E. Iron deficiency and educational achievement in Thailand. American journal of clinical nutrition, 1989; 50:687S-96S.
11. Pollitt E. Effects of a diet deficient in iron on the growth and development of preschool and school aged children. Food and nutrition bulletin, 1991;13:110-18
12. Masawe MJ. The adverse effect of iron retention on the course of certain infections. British medical journal, 1987; 2:1113-15.
13. Mason J. Recent trends in developing regions: vitamin A, , anemia iodine deficiency and child underweight. Food and nutrition bulletin, 2005; 26(1):59-108.
14. Mohammed K, Malekafzali H. Nationl Health and Diseases Survey in the Islamic Republic of Iran. Tehran, Undersecretary for Reaserch, Ministry of Health and Medical Education, 1999.
15. Dallman PR,Yp R and Johnson C. Prevalence and causes of anemia in the United States, 1976 to 1980. American journal of clinical nutrition, 1984;39:437-45.
16. Nestel P,ed. Proceeding: iron interventions for child survival. London, United States Agency for International development (USAID), Opportunities for Micronutrient Interventions (OMNI), and Institute for Child Health (ICH), 1995.
17. Khor GL. Update on the prevalence of malnutrition among children in Asia Nepal Medical College journal, 2003; 5(2):113-22.