

Prevalence of Anaemia Based on Haemoglobin Levels among Under Five Years Children in Combined Military Hospital, Sylhet

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Abstract

Introduction: Anaemia is the commonest nutritional problem in the world but the burden of anaemia is disproportionately borne among children in developing countries. Physical, mental and social development of the children are adversely affected by childhood anaemia.

Objective: To assess the prevalence and severity of anaemia based on haemoglobin levels in children less than five years of age attending in Combined Military Hospital (CMH), Sylhet.

Materials and Methods: This cross sectional study was conducted at CMH, Sylhet from January 2018 to December 2018. The study included 184 children aged 6 months to less than 5 years. Personal data and history of co-existing medical conditions were collected by data collection sheet and then analyzed.

Results: The prevalence of anaemia was 74(40.2%). Out of the anaemic under five children, 46 (75.7%) had mild anaemia, 18(24.3%) had moderate anaemia, and no one had severe anaemia (WHO definition). There was no significant difference for prevalence of anaemia in relation to sex and age different groups.

Conclusion: The prevalence of anaemia in 6 months to less than 5 years children was found to be high, given the negative impact of anaemia on the development of children in future, so there is an urgent need for effective and efficient remedial health interventions.

Key-words: Anaemia, Prevalence, Haemoglobin, Under five years children.

Introduction

Anemia is present when the hemoglobin level in the blood is below the lower extreme of the normal range for the age and sex of the individual¹. According to the World Health Organization (WHO), the threshold Hb level for being anaemic² is less than 11 gm/dl for under five children. Anaemia affects 1.62 billion people worldwide. The prevalence of anaemia is more in pre-school children. Globally, 293.1 million (47.4%) under five years children are anaemic^{3,4}.

Physical and behavioral growth, performance in school, cognitive advancement and immunization ability of children against disease

are adversely affected by anaemia. In developing countries it remains a major cause of morbidity and mortality where resources to determine the underlying etiology remain poor⁵. Although the etiology of anaemia among children is multi-factorial, the most significant correlates to the onset of childhood anaemia is iron deficiency with a smaller proportion due to deficiencies of such micronutrients as folate and B-12⁶. In developing countries the prevalence of iron deficiency anaemia varies; Villalpando notes the prevalence is four times higher than in developed countries⁷. Prevalence of anaemia varied across the different surveys in Bangladesh. According to the Nutritional Surveillance Project (NSP) it was 47 % in 2001 and 68 % in 2004 among under 5 years children⁸.

Objective

To evaluate the prevalence of anaemia based on haemoglobin levels in under five-year-old children attending in Combined Military Hospital (CMH), Sylhet for estimation of blood Hb concentration and determination of severity of anaemia among the study subjects.

Materials and Methods

The cross sectional study was conducted in CMH, Sylhet from January 2018 to December 2018 among 184 children, selected by non probability sampling method and investigated for estimation of Hb concentration using Abbott Cell Dyn Ruby-Heamatology Analyzer. Children from both gender and age group of 6 months to <5 years old were included in this study. The children known to have haemoglobinopathies; currently consuming multivitamin or mineral supplements were excluded from the study. Data were collected by interviewing mother/guardian of the child. For the diagnosis of anaemia, WHO criteria for Hb threshold in different age group were used and according to this haemoglobin threshold is 11.0 gm/dl for age group of 6 months to 5 years⁹. According to WHO criteria, severity of anaemia⁹ is classified as severe anaemia: Hb <7.0 gm/dl; Hb 7.0-9.9gm/dl : moderate anaemia; Hb 10.0-10.9 gm/dl : mild anaemia.

Frequency and severity of anaemia were expressed as percentage. Unpaired t-test was done to compare the result between boys and girls and among different age groups. Data have been analyzed by SPSS for Windows 18.0. P values < 0.05 was accepted as level of significance.

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Results

In this study out of 184 children 110 (60%) were boys and 74(40%) were girls with boys to girls ratio was 1.5:1 (Figure-1). Among the 110 boys, 38 (34.5%) cases were in the age group of 6 months to 2 years and 72 (65.5%) cases were in the age group of more than 2 (>2) years to less than 5 years. Among the 74 girls, 24 (32.4%) cases were in the age group of 6 months to 2 years and 50 (67.6%) cases were in the age group of more than 2 years to less than 5 years. The predominant age group was more than 2 to less than 5 years 122(66.3%) (Table-I). Most of the father of under five years children were noncommissioned officer (NCO)s which was 115 (62.5%) followed by Sainik (Snk)s, noncommissioned enrolled (NCE)s and junior commissioned officer (JCO)s which were 33 (17.9%), 20 (10.9%) and 16 (8.7%) respectively (Figure-2).

In this study among the 184 children prevalence of anaemia were 74 (40.2%) and 110(59.8%) were non anaemic (Figure 3). Out of the anaemic under five children, 46 (75.7%) had mild anaemia, moderate anaemic was 18(24.3%), and no one had severe anaemia (Table-II). Prevalence of anaemia in relation to sex and age different groups, no significant difference ($p > 0.05$) was found (Table-III).

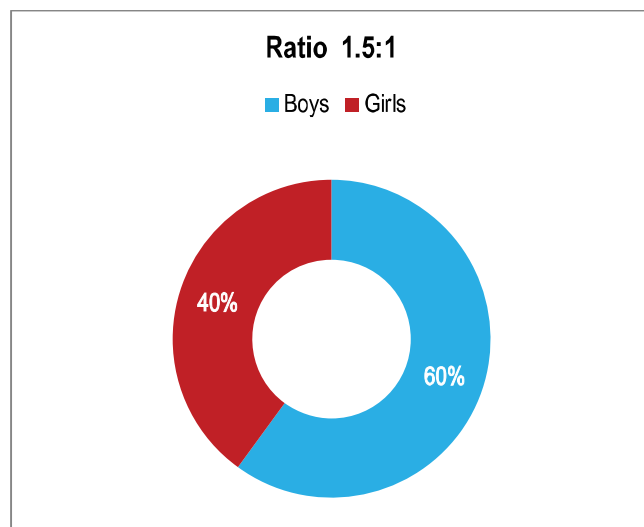


Figure -1: Distribution of sex of the responders (n=184)

Table-I: Distribution of age and sex among the study subjects (n=184)

| Age | Boys n(%) | Girls n(%) | Total n(%) |
|---------------------|-----------|------------|------------|
| 6 Months -2 Years | 38 (34.5) | 24 (32.4) | 62 (33.7) |
| >2 Years - <5 Years | 72 (65.5) | 50 (67.6) | 122 (66.3) |
| Total | 110 (100) | 74 (100) | 184 (100) |

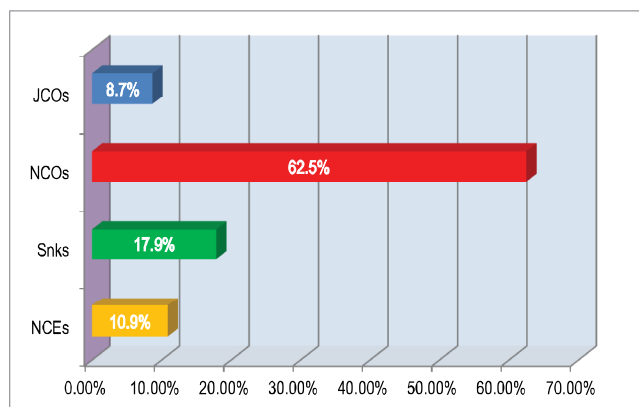


Figure-2: Occupation of father of the subjects (n=184)

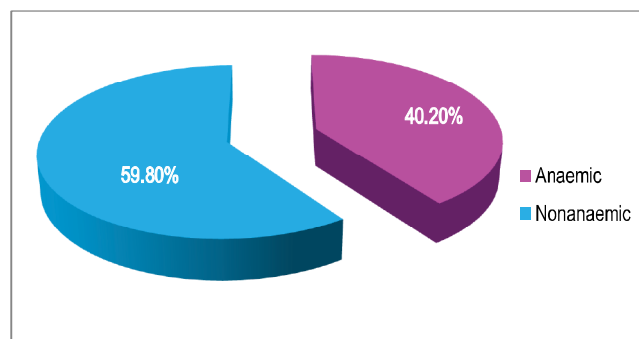


Figure-3: Distribution of children according to presence of anaemia (n=184)

Table-II: Severity of anaemia based on Hb concentration (n=74)

| Severity of Anaemia | Hb (gm/dl) | Frequency | % |
|---------------------|------------|-----------|------|
| Mild | 10.0-10.9 | 46 | 75.7 |
| Moderate | 7.0-9.9 | 18 | 24.3 |
| Severe | <7.0 | 00 | 00 |
| Total | | 74 | 100 |

Table-III: Distribution of anaemia according to age and sex (n=184)

| Variables | | No of Children | Anaemia n(%) | P value |
|-----------|---------------------|----------------|--------------|---------|
| Gender | Boys | 110 | 46(41.8) | >0.05 |
| | Girls | 74 | 28(37.8) | |
| Age | 6 Months -2 Years | 62 | 24(38.7) | >0.05 |
| | >2 Years - <5 Years | 122 | 50(41) | |

Discussion

Childhood anemia is a major public health problem in Bangladesh⁵. In this study, out of 184 under five-year children, 110(60%) were boys and 74(40%) were girls with boys to girls ratio was 1.5:1. Among the 110 boys, 38(34.5%) cases were in the age group of 6 months to 2 years and 72 (65.5%) cases were in the age group of more than 2 (>2) years to less than 5 years. Among the 74 girls, 24(32.4%) cases were in the age group of 6 months to 2 years and

50 (67.6%) cases were in the age group of more than 2 years to less than 5 years. The predominant age group was more than 2 to less than 5 years (66.3%). Most of the father of under five years children were noncommissioned officer (NCO)s which was 115(62.5%) followed by Sainik (Snk)s, noncommissioned enrolled (NCE)s and junior commissioned officer (JCO)s which were 33(17.9%), 20(10.9%) and 16(8.7%) respectively. This result reveals that about 40.2% of the children aged 6 months to <5 years are anaemic. This finding was similar to South Wollo, Northeast Ethiopia, they found 41.1%⁶ was the overall prevalence of anaemia⁶, Ethiopian Demographic and Health Service (DHS) reported the prevalence was 42% in 2016¹⁰ and study conducted 46% in Jimma, Ethiopia¹¹. However, the result of the our study is lower than the studies in Nepal which was 49.5%¹², 49.2% in South-East Nigeria¹³, 47.5% & 55.0% in Ghana Regional Hospital^{14,15}, 75.0% in Limpopo Province, South Africa¹⁶ and 52% by Khan et al in Bangladesh⁵. The difference might be due to variation in the sample size, sampling techniques and study design. The difference in the prevalence might also be due to variation in socio-demographic characteristics or due to variation in the geographical location of the study participants or economic status of parents in the areas. There are several potential causes of anemia has been identified which include, nutritional-low iron intake and low vitamin C intake; parasitic infections etc. Development of anemia among under five-year-old children is multi-factorial¹⁷.

In our study, regarding the levels of anaemic status, the majority of the anaemic children had mild anaemia (75.7%) followed by moderate anaemia (24.3%) and severe anaemia (0%). The studies conducted in Northeast Ethiopia found that 112 (67.5%) was mild, 52(31.3%) was moderate anemia, and 2(1.2%) was severe anemia⁶, 43.3%, 15.8%, and 0.5% had mild, moderate and severe anaemia respectively in Nepal¹² and in India 67.5% was mild anemia, 31.3% had moderate anemia, and 1.2% had severe anemia among under five children¹⁸. However, our result is deviated from EDHS 2016 report showed highest level of anaemia in Somali Region (83%)¹⁰.

In this study there was no association of anaemia between age and sex difference. However, some studies found a higher prevalence in boys than girls^{19,20} and other studies found higher in girls than boys¹⁶. Differential intake of iron-rich foods between genders may be explained this inconsistency.

One of the limitations of this study is that this study is conducted at a health center; hence, further community based studies should be conducted to have findings more representing the whole population. Despite the limitations, we have determined the magnitude of anemia and severity of anaemia among children aged 6months to less than 5 years in CMH, Sylhet. Motivation and education will play a vital role in handling anemia.

Awareness is created not only amongst the sufferers but also in those who are entrusted with to mitigate the problem. The Antenatal Care (ANC) services should be improved. Health service providers

are either not aware or are not applying the Institute of Public Health Nutrition (IPHN) guidelines for the prevention and control of anemia. They lack knowledge, counseling skills, communication materials, time and motivation to counsel mothers on the importance of iron-folate supplementation (IFA) and other interventions to prevent anemia and how to manage side effects, and to monitor compliance with IFA supplementation⁸.

Conclusion

Anaemia in children is a common preventable health issue in under five-year-old children. The findings of the study will assist to take necessary steps and design for proper interventions that target under 5 years children along their parents. However, further study is needed to understand the specific set of determinants of anaemia among children aged under 5 years.

References

1. Firkin F, Chesterman C, Penington D et al. De Gruchy's Clinical Haematology in Medical Practice. 5th ed. Massachusetts, USA: Blackwell; 1989:25.
2. WHO. Haemoglobin concentrations for the diagnosis of anaemia and assessment of severity Vitamin and Mineral Nutrition Information System. World Health Organization, Geneva; 2011:1-6.
3. Benoist Bd, McLean E, Egll I et al. Worldwide prevalence of anaemia 1993–2005: WHO global database on anaemia. Geneva, World Health Organization. 2008:7-8
4. McLean E, Cogswell M, Egll I et al. Worldwide prevalence of anaemia, WHO vitamin and mineral nutrition information system, 1993–2005. Public health nutrition. 2009; 12(4):444–54.
5. Khan JR, Awan N, Misu F. Determinants of anemia among 6–59 months aged children in Bangladesh: evidence from nationally representative data. BMC Pediatrics. 2016(3):1-12.
6. Gebreweld A, Ali N, Ali R et al. Prevalence of anemia and its associated factors among children under five years of age attending at Gugufu health center, South Wollo, Northeast Ethiopia. PLOS ONE. 2019; 14(7):e0218961.
7. Villalpando S, Shamah-Levy T, Ramirez-Silva CI et al. Prevalence of anemia in children 1 to 12 years of age: results from a nationwide probabilistic survey in Mexico. Salud Publica Mex. 2003; 45(Suppl 4):S490–98.
8. Rashid M, Flora MS, Moni MA et al. Reviewing Anemia and iron folic acid supplementation program in Bangladesh- a special article. Bangladesh Med J. 2010; 39(3):1-6.
9. WHO. Iron deficiency anemia assessment, prevention and control. A guide for programme managers. Geneva; World Health Organization 2001:33
10. Central Statistical Agency (CSA) and ICF. Ethiopia Demographic and Health Survey 2016. Addis Ababa, Ethiopia, and Rockville, Maryland, USA: CSA and ICF. 2017:195-7.

11. Getaneh T, Girma T, Belachew T et al. The utility of pallor detecting anemia in under five years old children. *Ethiopian Medical Journal*. 2000; 38(2):77–84.
12. Joshi S, Pradhan MP, Joshi U. Prevalence of anaemia among children under five years in tertiary care hospital of Nepal. *Medical Journal of Shree Birendra Hospital*. 2014; 13(1):33–6.
13. Ughasoro MD, Emodi I, Okafor H et al. Prevalence and risk factors of anaemia in paediatric patients in South-East Nigeria. *South African Journal of Child Health*. 2015; 9(1):14–7.
14. Parbey PA, Kyei-Duodu G, Takramah W et al. Prevalence of anaemia and associated risk factors among children under five years in Hohoe Municipality, Ghana. *Journal of Scientific Research & Reports*. 2017; 15(2):1–12.
15. Adu AJ, Allotey EA, Kwasi DA et al. Prevalence and morphological types of anaemia among children under-five years in the Volta regional hospital of Ghana. *Open Access Library Journal*. 2018; 5(02):1-10
16. Heckman J, Samie A, Bessong P et al. Anaemia among clinically well under-fives attending a community health centre in Venda, Limpopo Province. *South African Medical Journal*. 2010; 100(7):445–8.
17. Singh S, Parihar S. Prevalence of anemia in under five-year-old children: A hospital-based study. *International Journal of Contemporary Pediatrics*. 2019, 6(2):842-7.
18. Shakuntal G, Mane AS. Anemia in pediatric patients under five years old: A cross-sectional study. *Scholars Journal of Applied Medical Sciences*. 2016; 4(6):2020–2.
19. Woldie H, Kebede Y, Tariku A. Factors associated with anemia among children aged 6–23 months attending growth monitoring at Tsitsika health center, Wag-Himra zone, Northeast Ethiopia. *Journal of Nutrition and Metabolism*. 2015:2015.
20. Guled RA, Mamat NM, Balachew T et al. Predictors and prevalence of anemia, among children aged 6 to 59 months in shebelle zone, somali region, eastern Ethiopia: A cross sectional study. *International Journal of Development Research*. 2017; 7(1):11189–96.