

Original Research Article

Trend in distribution pattern of anaemia in children 6 months to 5 year: a prospective hospital based study

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ABSTRACT

Background: Anaemia is a global Public health problem, in our study we aimed at assessing trend in the distribution pattern of anaemia and etiology among the children.

Methods: It's a prospective study conducted in Department of Pediatrics, KIMS Bangalore for a period of 1 years. Children aged 6 months to 5 years admitted in ward for various purposes in whom Hb value is suggestive of anaemia according to WHO guidelines were included after consent and were further evaluated for the cause of anaemia.

Results: Total 435 cases met our inclusion criteria, out of which 147 cases gave consent for further workup and were enrolled in the study. 81 cases of mild anaemia, 42 cases of moderate anaemia, and 24 cases of severe anaemia were reported. Further, most common etiology in all groups was Iron deficiency anaemia. Nutritional Anaemia was most commonly seen in low socio-economic background.

Conclusions: Nutritional anaemia is the most common etiology found in our study. By improving nutritional status we can improve the quality of life in children.

Keywords: Anaemia, Children, Iron deficiency, Thalassemia

INTRODUCTION

Anaemia is a condition in which the number of red blood cells is insufficient to meet the body's physiologic needs. Specific physiologic needs vary with gender, person's age, residential elevation above sea level (altitude), smoking behaviour, and different stages of pregnancy.

Anaemia is a major public health problem that affects developing as well as developed countries and has significant adverse health consequences, as well as adverse impacts on economic and social development.¹⁻⁴ Anaemia is the most important cause of morbidity and mortality in children and nearly one-third of the population is found to be anaemic due various reasons.⁵⁻⁸

Globally, 43% of children aged 6 months to 5 years found to be anaemic.⁹ According to WHO anaemia is Hemoglobin concentration less than 11g/dl in children 6months to 5 years, below 11.5g/dl in children 5year to 11 years and below 12g/dl in children 12-14 year.¹⁰ Anaemia can be due to various types; Nutritional anaemia is important among children especially in developing countries. 20% of all death occurs globally in children under five years of age.¹¹ Anaemia is direct cause of death when it is severe.¹² Also, it is recognised that mild and moderate anaemia may also contribute to mortality risk.¹³

Half of the anaemic cases are due to Iron deficiency, children with Iron deficiency anaemia will have feeding problems, delay in growth and development, Low IQ,

Decreased scholastic performance.^{12,14-15} Anaemia is a major problem in India especially in children; this problem will persists to adolescence if unrecognised in childhood, hence our study was conducted to know the trend in distribution pattern as well as etiology of anaemia among the children admitted to KIMS Bangalore for various other reasons.

METHODS

This is a Prospective observational study conducted in Department of pediatrics, KIMS Bangalore for a period of 1 year from September 2016 to august 2017. Children aged 6 months to 5 year who are admitted to Wards for various reason or those presented with signs and symptoms suggestive of anaemia in whom laboratory value of Haemoglobin suggestive of anaemia according to WHO criteria were included in the study after obtaining consent. Attenders those who are not agreeing for further follow up or further investigation were excluded from study. Diseases with third space loss, known case of anaemia on follow up, known case of chronic kidney disease, those who are living in high attitude (1000 meter above the sea level) were excluded from the study.

In each case detailed history is taken with a special focus on diet history, also these cases were further worked up either inpatient or on OPD bases for the cause of anaemia. The data obtained were entered in excel and analyzed accordingly.

RESULTS

Total 435 cases met our inclusion criteria but further only 147 cases were enrolled for the study as remaining cases were excluded as they were not willing for further follow up or they met our exclusion criteria.

Table 1 showing sex distribution and age wise distribution of cases. Out of 147 cases included, 78 cases 53 (%) were girls, 69 cases (47%) were males. 89 cases (60%) were below 2 years, 58 cases (40%) were above 2 years.

Table 1: Sex distribution and age wise distribution.

	Male	Female	Total (%)
Less than 2 years	39	50	89 (60%)
Above 3 years	30	28	58 (40%)
Total	69	78	147

Table 2: Severity of anaemia.

	No. of cases (%)
Mild	81 (55%)
Moderate	42 (28%)
Severe	24 (17%)

Table 2 showing severity of anaemia, 81 cases (55%) were diagnosed to have mild anaemia, 42 (28%) cases were grouped into moderate anaemia, 24 (17%) cases had severe anaemia.

Table 3 showing common presenting symptom, in 38 cases fever was the presenting symptom, pallor was presenting symptom in 24 cases, dyspnoea in 21 cases, icterus in 7 cases, 57 cases presented with another symptom.

Table 3: Common presenting symptom.

Symptoms	No. of cases (%)
Fever	38 (25%)
Pallor	24 (16%)
Dyspnoea	21 (14%)
Icterus	07 (04%)
Others	57 (41%)

Table 4 showing signs at the time of admission, all cases had pallor, 87 cases (59%) had hepatomegaly, 22 cases (15%) had splenomegaly, 7 cases (4%) had icterus, 2 cases had haemolytic facies.

Table 4: Signs at the time of admission.

Signs	No. of cases (%)
Pallor	147 (100%)
Hepatomegaly	87 (59%)
Splenomegaly	22 (15%)
Icterus	07 (04%)
Haemolytic facies	02 (1%)

Figure 1 showing socio-economic status of the cases, 69 cases (47%) belongs to low socio-economic status, 41 (28%) cases belongs to middle economic status, 37 cases (25%) were belongs to high socio-economic status.

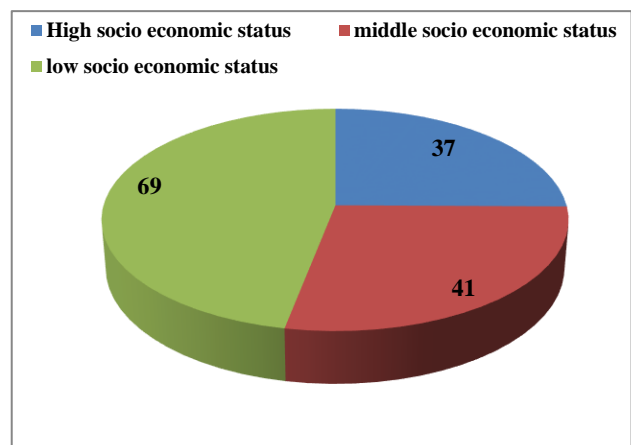


Figure 1: Socio-economic status of the cases.

Table 5 showing clinical diagnosis of all cases, 52% cases were iron deficiency anaemia, 12% cases were Vitamin B12 deficiency, 5% of cases were sickle cell

disease, 12% of the cases were thalassemia, 3% of cases were malaria, 9% of cases were due to G6PD deficiency, 6% of the cases were due to Drug induced haemolytic anaemia, 1% cases were due to leukemia.

Table 5: Clinical diagnosis of all cases.

Clinical diagnosis	No. of cases (%)
Iron deficiency anaemia	77 (52%)
Vitamin B12 deficiency	18 (12%)
Sickle cell anaemia	07 (05%)
Thalassemia	17 (12%)
Malaria	05 (03%)
G6PD deficiency	12 (09%)
Drug Induced haemolytic anaemia	09 (06%)
Leukemia	02 (01%)

DISCUSSION

Anaemia is an important social burden in our society especially in children, there are lot of studies done regarding the incidence of severe anaemia, also other studies have enrolled anaemia cases which are presented with signs and symptoms suggestive anaemia, There are many studies in India regarding nutritional anaemia but in this study we included all the children who presented to hospital with various problems in whom Haemoglobin level was suggestive of anaemia according to WHO protocol and cause was identified among.

The prevalence of anaemia among less than 5 years children in our study found to be 47%, the study done by Reha et al in Tanzania reported prevalence of 77.2%.¹⁶ The proportion of mild, moderate and severe anaemia is 55%, 28% and 17% respectively whereas reha et al¹⁶ reported mild, moderate and severe anaemia in there study as 16.5%, 33.5%, 27.7% respectively. Muthuswamy et al reported mild, moderate, severe anaemia proportion as 24.2%, 24.2%, 1.7% respectively.¹⁷ Various factors influence the occurrence of anaemia as well as proportion of severity of anaemia such as place where the study was conducted, nutritional status of the community, educational background of the society, malaria endemicity, and parasite load.

There was slight female predominance in our study. Sudha gandhi et al reported 67.7% of females and 35.5% of male are anaemic but this study included school going children.¹⁸ In contrary to this Study done by Gupta A et al reported male predominance in their study.¹⁹ However, unlike other studies there was not much difference in sex distribution.

The proportion of anaemia in children below 2 years was much higher compared to other age group. The study done by Neves in children 6 months to 2 years reported prevalence of anaemia of 55.1%.²⁰ Chavhan et al reported higher proportion of anaemia cases in 1-3 year age group.²¹ However the prevalence of problem in under 2 year children is likely to be a combined result of

increased iron requirement due to rapid growth in this period, early weaning/ delayed weaning, low availability of food rich in iron and dietary monotony.

Most common presenting complaint seeking medical attention was fever, pallor followed by dyspnoea. In our study we included all the cases irrespective of whether primary problem is anaemia, or they have come to hospital for some other problem in whom anaemia was an incidental finding. Due to this reason presenting complaint may vary. Chavhan et al also reported fever and anorexia as most common presenting complaint. Common sign reported in our study is Pallor, hepatomegaly followed by splenomegaly.²¹ Similarly study done by Chavhan et al also reported pallor, hepatomegaly as common sign in there study.²¹

Majority of the cases reported in our study were mild anaemia followed by moderate and severe anaemia. Iron deficiency was the most common cause of anaemia in our study; this is followed by hereditary defects. This signifies the important burden of iron deficiency in our community. Various other studies also have reported Nutritional anaemia as most common cause of anaemia in their studies. Most of the cases of anaemia were belongs to low socio-economic status. Malnutrition, lack of education, lack of cleanliness, and worm infestation are common among low socio-economic group, the interplay of this factors could be the cause of anaemia among this group. Further most of the mild anaemia cases were due to iron deficiency and most of the severe anaemia cases had either hereditary defect as a problem or leukaemia was the finding in them.

The other study also reported iron deficiency as an important and most common cause of anaemia in children.²² The etiology of severe anaemia depends on geographical area, for example a study done by muoneke et al reported malaria as a common cause of severe anaemia in their study.²³

CONCLUSION

Anaemia is an important cause of morbidity in children. Most of the cases of anaemia are due to Iron Deficiency. By adapting various majors like health education, iron prophylaxis in pregnant mother and educating the community regarding consequences of iron deficiency we can reduce the burden of iron deficiency among this vulnerable group. Thus, it's important to know the etiological pattern of anaemia in our community so that effective measures can be taken to tackle the problem. Further studies are needed in detail to identify the cause of nutritional deficiency among our population.

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REFERENCES

1. Stevens GA, Finucane MM, De-Regil LM, Paciorek CJ, Flaxman SR, Branca F et al. Global, regional and national trends in haemoglobin concentration and prevalence of total and severe anaemia in children and pregnant and non-pregnant women for 1995–2011: a systematic analysis of population-representative data. *Lancet Glob Health.* 2013;1:E16-25.
2. Alcázar L. The economic impact of anaemia in Peru. Lima: Group for the Analysis of Development and Action Against Hunger; 2013.
3. Horton S, Levin C. Commentary on “evidence that iron deficiency anemia causes reduced work capacity”. *J Nutr.* 2001;131:691S-6S.
4. Horton S, Ross J. The economics of iron deficiency. *Food Policy.* 2003;28:51-75.
5. McLean E, Cogswell M, Egli I, Wojdyla D, de Benoist B. Worldwide prevalence of anaemia, WHO Vitamin and Mineral Nutrition Information System, 1993-2005. *Public Health Nutr.* 2009 Apr;12(4):444-54.
6. Leite MS, Cardoso AM, Coimbra CE, Welch JR, Gugelmin SA, Lira PC, Horta BL, Santos RV, Escobar AL. Prevalence of anemia and associated factors among indigenous children in Brazil: results from the First National Survey of Indigenous People's Health and Nutrition. *Nutr J.* 2013 Dec;12(1):69.
7. Milman N. Anemia still a major health problem in many parts of the world! *Ann Hematol.* 2011 Apr;90 (4):369-77.
8. Khambalia AZ, Aimone AM, Zlotkin SH. Burden of anemia among indigenous populations. *Nutr Rev.* 2011 Dec; 69(12):693-719.
9. Stevens GA, Finucane MM, De-Regil LM, Paciorek CJ, Flaxman SR, Branca F, et al. Global, regional, and national trends in haemoglobin concentration and prevalence of total and severe anaemia in children and pregnant and non-pregnant women for 1995-2011: A Systemic analysis of Population-representative data. *Lancet Glob. Health.* 2013;e16-e25.
10. World health organization. Haemoglobin concentration for the diagnosis of anaemia and assessment of severity. Vitamin and mineral nutrition information system. WHO; Geneva, Switzerland, 2011. Available at: http://www.who.int/gho/publications/world_health_statistics/2013/en/.
11. Kassebaum NJ, Jasrasaria R, Naghavi M, Wulf SK, Johns N, Lozano R, et al. A Systemic analysis of global anaemia burden from 1990 to 2010. *Blood.* 2014;123:615-24.
12. Stoltzfus RJ, Mullany L, Black RE. Comparative Quantification of Health risks: Global and Regional Burden of Disease Attributable to selected Major risk factors. World Health Organisation; Geneva, Switzerland, Iron deficiency anaemia. 2004;163-209.
13. Felt BT, Lozoff B. Brain iron and behaviour of rats are not normalized by treatment of iron deficiency anaemia during early development. *J Nutr.* 1996;126:693-701.
14. Bener A, Kamal M, Bener H, Bhugra D. Higher prevalence of iron deficiency as strong predictor of attention deficit hyperactivity disorder in children. *Ann Med Health Sci Res.* 2014;4:291-7.
15. Simbauranga RH, Kamugisha E, Hokororo A, Kidenya BR, Makani J. Prevalence and factors associated with severe anaemia amongst under-five children hospitalized at Bugando Medical Centre, Mwanza, Tanzania. *BMC Hematol.* 2015 Dec;15(1):13.
16. Muthuswamy BG, Venugopal V, Sumithra S. Prevalence of anaemia among the hospitalized children in a rural tertiary care teaching hospital. *Int J Contemp Pediatr.* 2017;4:431.
17. Sudhagandhi B, Sundaresan S, William WE, Prema A. Prevalence of anaemia in the school children of kattankulathur, Tamil nadu, India. *Int J Nutr Pharmacol Neurol Dis.* 2011;1:184-8.
18. Guptab A, Gangoli K, Pradeep K. Prevalence and causation of anaemia among pediatric age group pateints, *Int J Med Pediatr Oncol.* 2016;2(4):166-9.
19. Neves MB, Silva EM, Moraes MB. Prevalence oand factors associated with iron deficiency in infants treated at a primary care centre in Belen, para, Brazil. *Cad Saude Publica.* 2005;21(6):1911-8.
20. Chavhan NB, Natu SA. A Study of clinical profile and etiology of severe anaemia in children aged 6 months to 5 year. *GJRA.* 2016;5(6).
21. Hassan K, Sulliavan KM, Yip R, Woodruff BA. Factors associated with anaemia in refugee children. *J Nutr.* 1997;127:2194-8.
22. Muoneke VU, ChidiIbekwe R. Prevalence and aetiology of severe anaemia in under-5 children in Abakaliki South Eastern Nigeria. *Pediatr Therapeut.* 2011;1(107):2161-0665.

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