International Journal of Research in Medical Sciences
Madoori S et al. Int J Res Med Sci. 2015 Dec;3(12):3567-3571
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012

DOI: http://dx.doi.org/10.18203/2320-6012.ijrms20151400

Research Article

Clinico hematological profile and outcome of anemia in children at tertiary care hospital, Karimnagar, Telangana, India

Srinivas Madoori*, Ramya C., Shashidhar Valugula, Sandeep G., Sreenivas Kotla

Department of Pediatrics, Chalmeda Anand Rao Institute of Medical Sciences, Bommakal, Karimnagar, Telangana, India

Received: 02 October 2015
Revised: 13 October 2015
Accepted: 16 November 2015

***Correspondence:**
Dr. Srinivas Madoori,
E-mail: madoorisrinivas@gmail.com

ABSTRACT

Background: Anemia is a common health problem worldwide. It is an important cause of morbidity and mortality of young and growing children in rural areas of developing countries. Young growing anemic children have various clinical symptoms, pallor, Jaundice, fever, cough, breathlessness, hyper pigmentation, tremors, and hepatosplenomegaly. The main objective is to study the clinical and haematological profile and variants of anemia in children of age 2 months to 14 years admitted in tertiary care hospital, Karimnagar.
Methods: A retrospective study was carried out by studying medical records of hospital attached to Chalmeda Institute of Medical Sciences, Karimnagar between January 2010 to December 2014. Study population constitutes total number of 316 cases of anemia in children of age 2 months to 14 years admitted in tertiary care hospital of Karimnagar. Diagnosis of anemia was based on hemoglobin levels and on the basis of clinical presentations. Classification of anemia was done by clinical findings, complete blood picture with peripheral smear and hemoglobin electrophoresis.
Results: In present study out of 316 cases, 173 were males and 143 were females. It was found that 58% of children were anemic due to iron deficiency anemia, 27 % were having sickle cell disorder, 9 % were having Thalassemia, and 5 % with megaloblastic anemia and 2% with aplastic anemia.
Conclusions: Besides haematological investigations for typing of anemia, Haemoglobin electrophoresis establishes the disease in haemoglobinopathies. Adequate health and healthy nutritional habits and prescription of Iron supplements are of great importance in prevention and management of anemia in children assisted by public health services.

Keywords: Anemia, Iron deficiency anemia (IDA), Sickle cell disorder, Vitamin B_{12} deficiency

INTRODUCTION

Anemia is one of the most important disorders of blood in infancy and early childhood. These result in significant morbidity and mortality in children and constitute a public health problem of considerable importance.[1] Anemia is generally defined as a reduction in red cell mass or blood hemoglobin concentration characterized by decreased oxygen carrying capacity of blood which results in tissue anoxia producing various signs and symptoms. Anemia is not a diagnosis in itself but merely an objective sign of presence of disease. Anemia in children differs from those of adults as they tend to be more pronounced and develop rapidly. As much as 51% children in 0-4 years and 46% children 5-12 years are anemic in developing regions.[1-3] Anemia continues to be a public health problem of global proportions. It is the most common preventable

nutritional deficiency in children. The WHO has estimated that, globally 1.62 billion people are anemic with the highest prevalence of anemia (47.4%) among preschool aged children, of these 293 million children, 89 million live in India while prevalence of anemia among school children is 25.4% 4. Iron deficiency anemia affects 30% of the world population.[5,6] The prevalence of anemia among children under 5 years of age is estimated to be about 20% in industrialized countries and 39% in non-industrialized countries.[7] Anemia is a leading cause of morbidity and mortality worldwide. In India, the national program for prevention and control of anemia focuses on pregnant women and young children less than 5 years.

The main objective is to study the hematological profile and variant of anemia in children aged 2 months to 14 years admitted in tertiary care hospital Karimnagar, Telangana, India.

METHODS

This study is a hospital based retrospective cross sectional observational study. It is conducted at Chalmeda Anand Rao Institute of medical sciences, Karimnagar, Telangana, South India between January 2010 - December 2014. The participants of our study were children who were admitted in pediatric ward of Chalmeda Anand Rao institute of medical sciences. Children with severe pallor aged 2 months to 14 years admitted in the pediatric wards were enrolled. Investigations for anemia and its causes i.e. peripheral smear, serum vitamin B12, serum folic acid, stool for worm infestation were done in all patients. The type of anemia was done based on these reports. Hemoglobin was estimated by Sahli's method and expressed in gm%, peripheral smear was stained by Leishman's stain . PCV, MCV, MCH, MCHC and RDW were determined by automated cell counter. Normal values were taken as follows: PCV 35-45%, MCV 77-95fl, MCH 25-33pg, MCHC 31-37gm/dl and RDW 14.5-18.5.Reticulocyte count was done by Brilliant crystal stain method, serum iron determination was done by Ramany's dipyridyl method, Total iron binding capacity was determined by Ramsay's method, serum vitamin B12 and folic acid was determined by Architect method.

Inclusion criteria: Patients with anemia in age group of 2 months to 14 years admitted in Chalmeda institute of medical sciences included in this study.

Exclusion criteria: Infants less than 2 months and teen agers more than 14 years, out patients who were not admitted in the hospital, Patients having mild to moderate anemia, severe anemia due to malaria, and patients collapsed due to congestive cardiac failure within 12 hours of admission, communicable diseases like HIV, tuberculosis & hepatitis were excluded.

RESULTS

A total of 316 patients were admitted to pediatric ward at our institute from Jan 2010 to Dec 2014 of which 143 were females and 173 males. In the present study it was found that of 58% (183) children were anemic due to iron deficiency anemia while 9 % (29) were thalasemic and 27% (85) were sickle cell disorder. 5% (16) cases had megaloblastic anemia and 2% (6) with aplastic anemia.

Table 1: Gender wise distribution of anemia.

Year	2010	2011	2012	2013	2014	Total
Males	22	35	31	44	41	173
Females	25	19	23	46	30	143
Total	47	54	54	90	71	316

Table 2: Prevalence of different types of anemia

Disease	No	%
Iron deficiency Anemia	183	58
Sickle cell Anemia	85	27
Thalassemia	29	9
Aplastic Anemia	6	2
Megaloblastic Anemia	16	5

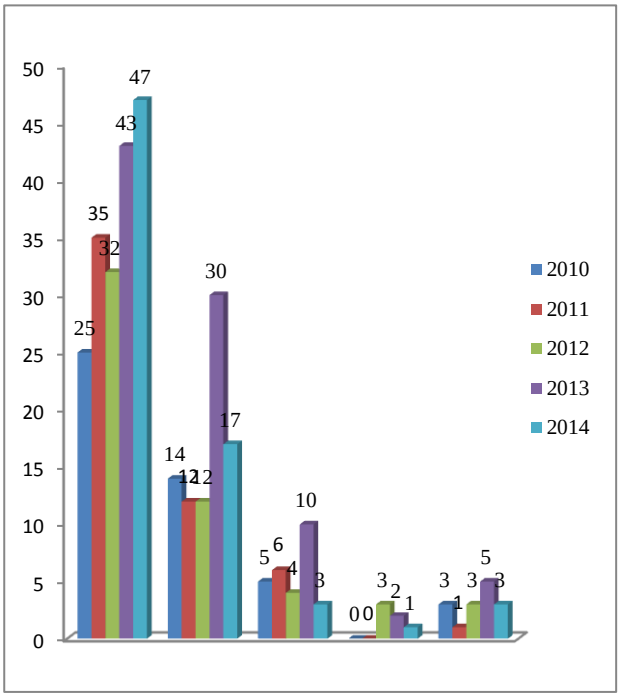

Figure 1: Number of anemia cases for every year.

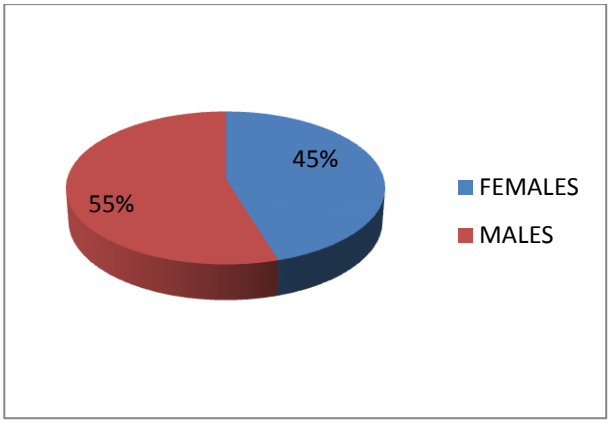

Figure 2: Sex wise distribution of anemia.

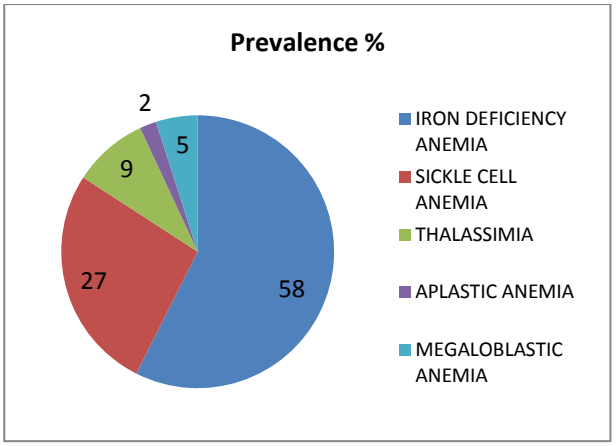

Figure 3: Clinical profile of patients with anemia.

Table 3: Clinical profile of patients with anemia.

Clinical profile	2010	2011	2012	2013	2014	N=316	%
Pallor	33	41	40	73	47	234	74.05
Icterus	5	8	8	8	21	50	15.82
Fever	36	19	35	65	27	182	57.59
Cough/ coryza	11	3	17	23	9	63	19.94
Hyperpigmentation	2	1	0	2	0	5	1.58
Lethargy	1	2	2	0	2	5	1.58
Splenomegaly	23	8	17	34	15	97	30.70
Tremors	0	0	0	1	0	1	0.32
Hepatomegaly	13	14	10	30	6	73	23.10
Petechiae	0	0	0	0	0	0	0.00
Pedal edema	4	2	1	2	2	11	3.48
Breathlessness	1	1	3	3	3	11	3.48
Bleeding manifestations	2	1	3	2	1	9	2.85

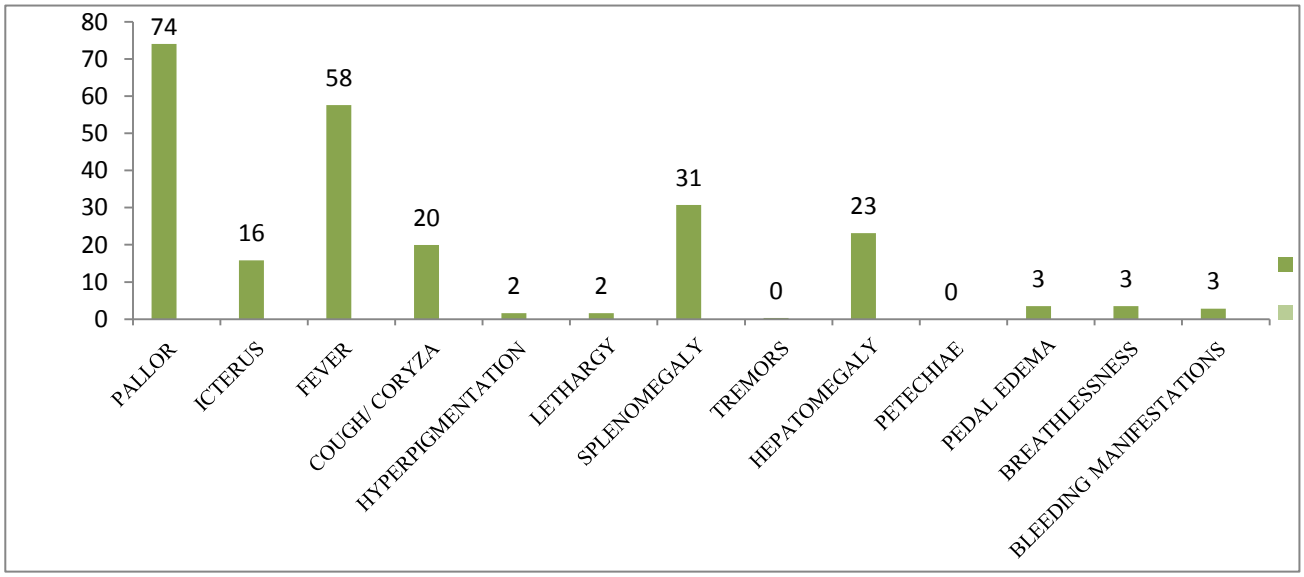

Figure 4: Percentage of clinical features of anemia in total (n=316 cases).

DISCUSSION

In the present study, 316 patients of anemia between the age group of 2 months-14 years have been studied clinically as well as by other investigations. The common cause in the study is iron deficiency (58%) while sickle cell disorders 27%, 9 % were thalasemic and 5 % cases had megaloblastic anemia and 2 % aplastic anemia. The increased prevalence of sickle cell disorder is due to our hospital being a referral Centre for both Adilabad and Karimnagar districts, Telangana, India. Prevalence of Sickle cell disorder in overall population is very high amongst tribal population. The same tribal population groups residing in the neighbouring district of Adilabad and Nizamabad have high prevalence of Sickle cell disorder. The overall prevalence among tribal population is about 10% for the carrier state and 0.5% for sufferer.[8] It is observed from our study that all types of anemia were due to poverty, maternal anemia, continued exclusive breast feeding beyond 6 months and improper complimentary diet. Males with high percentage of 55% and females with 45% were found in our study. Rationale reason for the cause of anemia more in male as compared to females can be because of expression of anemia due to sickle cell disorder or Thalassemia in males as compared to females.[9] In the present study, pallor is the most common symptom followed by splenomegaly and cough. This is in accordance to previous studies fever,[6,10] splenomegaly, hepatomegaly was found in our study, which is in accordance previous studies.[5,6,10-13]

In the current study 58% patients with iron deficiency anemia, 27% patients with sickle cell disorder, 9% with thalasemia were transfused packed cell volume. Remaining patients were managed by oral hematinics.

CONCLUSIONS

One of the major areas for improvement in primary health care is prevention of anemia because it has been associated with delay in psychomotor development especially in preschool age. Appropriate screening and subsequent diagnostic testing will allow most cases of anemia to be diagnosed at the earliest. Basal blood parameters are mandatory before treating children with anemia to avoid unwanted side effects. Anemia in association with malnutrition is widely prevalent in our country. So there is a need for urgent community participation strategies in the form of counseling the parents for child feeding practices, immunization and sickness recognition from the first year of life. Preventive measures for anemia control in children must be accompanied by measures to prevent underweight and stunting by focusing on integrated child feeding, health and environmental core measures.

ACKNOWLEDGEMENTS

Authors would like to thank the management of Chalmeda Anand Rao Institute of Medical Sciences, Karimnagar, Telangana, India for granting permission to conduct our study.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Gupte S, Gupta RK, Gupta R. Iron Deficiency Anemia: A Diagnostic Approach in Children. J K Science .2000;2:175-9.
2. Garder B. Anemias of Inadequate Production. In: Kliegman RM, Behrman RE, Jenson H B, Stanton B F(eds). Nelson Textbook of Pediatrics. 18th edn. Philadelphia, W.B. Saunders. 2008:2011-4.
3. Gupte S: Pediatric Hematology . In Gupte S. The Short Textbook of Pediatrics. 10th edn. New Delhi. Jaypee. 2004:454-62.
4. Worldwide Prevalence of Anemia 1993–2005. Geneva, Switzerland: World Health Organization; 2008.
5. Shally A, Rohini D, Tuhina V, Sheila V. Anemia and Undernutrition among Preschool Children in Uttar Pradesh, India. Indian Pediatrics.2003; 40:985-90.
6. Sarah EC, Zuguo M, Freedman DS, A Looker AC, Ogden CL, Gunter E, et al. Unexplained decline in the prevalence of anemia among US children and women between 1988-1994 and 1999-2002. Am J of Clin Nutr. 2008;88(6):1611-7.
7. Keikhaei B, Zandian K,Ghasemi A, Tabibi R. Iron-deficiency anemia among children in southwest Iran. Food and Nutrition Bulletin©. The United Nations University. 2007;28(4):406-11.
8. Sachdev H, Gera T, Nestel P. Effect of iron supplementation on mental and motor development in children: systematic review of randomized controlled trials. Public Health Nutr. 2005;8(2): 117-32.
9. Meshram SA. A hospital based study on anaemia in children of Adilabad -a tribal district of Andhra Pradesh.Int J Biol Med Res. 2013;4(1):2894-7.
10. Calis JC, Phiri KS, Faragher EB, Brabin BJ, Bates I, Cuevas LE et al. Severe Anemia in Malawian Children .The New England Journal of Medicine. 2008;358(9):888-99.
11. Keikhaei B, Zandian K, Ghasemi A, Tabibi R. Iron-deficiency anemia among children in southwest Iran. Food and Nutrition Bulletin. The United Nations University .2007;28(4)4:406-11.

12. Gutelius MF. The Problem of Iron Deficiency Anemia in Preschool Negro Children. AJPH. 1969;59(2):290-5.
13. Beinner MA, Lamounier JA. Food and Nutrition Bulletin. The United Nations University.2003;24(3):268-74.

Cite this article as: Madoori S, Ramya C, Valugula S, Sandeep G, Kotla S. Clinico hematological profile and outcome of anemia in children at tertiary care hospital, Karimnagar, Telangana,India. Int J Res Med Sci 2015;3:3567-71.