



Contents lists available at BioMedSciDirect Publications

## International Journal of Biological & Medical Research

Journal homepage: [www.biomedscidirect.com](http://www.biomedscidirect.com)



### Original Article

## A hospital based study on anaemia in children of Adilabad -a tribal district of Andhra Pradesh.

Swapnatai A Meshram<sup>a\*</sup>, Rajnish S Borkar<sup>b</sup>, Pramod E Jadhav<sup>c</sup>, I. Pranathi Sudha<sup>d</sup>,

<sup>a</sup>Associate Professor, Department of Physiology, RIMS, Adilabad.

<sup>b</sup>Associate Professor, Department of Community Medicine, RIMS, Adilabad

<sup>c</sup>Professor & HOD, Department of ENT, RIMS, Adilabad

<sup>d</sup>MBBS student, RIMS, Adilabad

#### ARTICLE INFO

##### Keywords:

Anaemia

Children

Electrophoresis

Hemoglobinopathies

#### ABSTRACT

**BACKGROUND:-** Anaemia is common worldwide health problem. It is an important cause of morbidity and mortality of young growing children in rural areas of developing countries. Young growing anaemic children have various clinical symptoms, failure to thrive, jaundice, hepato- splenomegaly, cardiomegaly, pleural effusion, congestive heart failure. **OBJECTIVE: -** To study the haematological profile and variants of anaemia in children of age 2months to 12 years admitted in district hospital of Adilabad. **METHODOLOGY:-** A retrospective study was carried out by studying medical records of district hospital attached to Rajiv Gandhi Institute of Medical Sciences , Adilabad from May 2011 to July 2011. Study population constitute total number of 54 cases of anaemia in children of age 2months to 12 years admitted in district hospital of Adilabad. Diagnosis of anaemia was based on hemoglobin levels and on the basis of clinical presentations. Typing of anaemia was done by clinical finding, complete blood picture and haemoglobin electrophoresis. **RESULT:** In present study out of 54 cases, 26 were females and 28 males. The mean haemoglobin was  $4.87 \pm 1.35$  gm/dl. Maximum anaemic patients (48%) observed in the group of 8-12yrs. About 50% (27/54) of patients were severely anaemic, 48.1 % (26/54) moderately anaemic and only one case was of mild anaemia. In present study it was found that 57.39 % of children were anaemic due to nutritional deficiency while 18.5% were thalasemic and 29.6 % were sickle cell disorder. 66.6% cases had Nutritional anaemia. About 29 cases presented themselves with the clinical findings of pallor and splenomegaly. **CONCLUSION: -** Besides hematological investigations for typing of anaemias hemoglobin electrophoresis establishes the disease in haemoglobinopathies. Adequate health and healthy nutritional habits and prescription of Iron supplements are great importance to prevent and manage anaemia in children assisted by public health services.

© Copyright 2010 BioMedSciDirect Publications IJBMR -ISSN: 0976:6685. All rights reserved.

### 1. Introduction

Anaemia is defined as reduction of haemoglobin concentration in the blood less than 11gm/dl in under 5 children while less than 11.5 gm/dl for 6-12 years children (1). Anaemia, an important problem worldwide, is an increasing among young children in India and requires urgent attention. WHO has estimated that, globally, 1.62 billion people are anaemic, with the highest prevalence of anaemia (47.4%) among pre-school aged children: of these 293

million children, 89 million lives in India while prevalence of anaemia among school child is 25.4%(2).

The existence of anaemia may cause growth impairment tendency & infections also may cause delayed physical, motor, psychological, behaviour, cognitive & linguistic developmental mile stones especially less than 2yrs old. Therefore severe anaemia associated with increased morbidity & mortality in children (3,4,5,6). The most common cause of anaemia worldwide especially in developing countries is nutritional anaemia.

The determination of factors that influence the occurrence & maintenance of anaemia in a population is fundamental for the implementation of control measures. Our study was aimed to

\* Corresponding Author : **Swapnatai A Meshram**  
Associate Professor, Physiology,  
Rajiv Gandhi Institute of Medical Sciences, Adilabad  
Andhra Pradesh, ( A P ) - 504001  
E.mail: oshoborkar@rediffmail.com

study the haematological profile and variants of anaemia in the pediatric population from age 2 months to 12yrs of Adilabad district of Andhra Pradesh and to recommend for the preventive & control measures based on findings.

**OBJECTIVES:**

To study the haematological profile and variant of anaemia in children of age 2months to 12 years admitted in district hospital of Adilabad.

**2. Material and Methods**

Our present study was conducted in the district hospital of Adilabad region of Andhra Pradesh which is considered to be the most remote and tribal region of the state. The participants of our study were patients who were admitted in pediatric ward of district hospital of Adilabad. The study was conducted from May 2011 to July 2011.

**Inclusion criteria:-** Patients of anaemia in age group of 2 months to 12yrs admitted in District Hospital Adilabad were included in this study.

**Exclusion criteria:** - Infants less than 2 months and teen agers more than 12yrs and out patients who were not admitted in the hospital wards were excluded.

**Study procedures:** - (Using a patient's case sheet in the pediatric wards in order of admission). The diagnosis of anaemia was based on Haemoglobin levels and complete blood picture were done by senior laboratory technicians. Diagnosis of anaemia is typed and confirmed by Haemoglobin electrophoresis.

**Additional laboratory investigations:**

1. Total Haemoglobin Percentage with using Sahil's method.
2. Total RBC count with using Haymes fluid
3. Total WBC count with using Turk's fluid
4. Peripheral smear with using Leishmann's stain
5. Erythrocyte sedimentation Rate with Wintrob's methods
6. Osmotic fragility test by Sanford method
7. Sick cell test by Sodium meta bi sulfite method
8. Bio-chemical investigation by automated Haemoglobin electrophoresis

**Statistical methods**

Statistical methods that were used in our study were mean, percentage, standard deviation for various variables and Chi-square for the test of significance.

**3. Results**

In present study out 54 cases, 26 were females and 28 males. The mean haemoglobin was found to be  $4.87 \pm 1.35$  gm/dl. The mean haemoglobin of females in our study was  $5.8 \pm 1.39$  gm/dl (out of 54, 26 were females). The mean haemoglobin of male was  $2.34 \pm 1.06$  gm/dl (Table: 1 ). Maximum anaemic patients (48%) were observed in the group of 8-12yrs (Figure1). Majority of the patients (92.5%) were Hindu by Religion and only 7.4 % (4) of patients were from Muslim by religion ( Table : 2).

About 50% (27/54) of patients were categorized in severe anaemia , 48.1 % (26/54) were moderately anaemic and only one case was of mild anaemia (Figure 2).

In present study it was found that 44.5 % of anaemia in children is due to nutritional deficiency while 13% were thalassaemic and 20.4 % were sickle cell disorder, 5cases were having both sickle cell and thalassaemia, 4 cases of leukemia, 2 cases of malaria and only one case of hookworm infestation.

There were majority of cases of Iron deficiency anaemia in nutritional anaemia. There were 3 cases of thalassaemia major, 6 cases of thalassaemia trait, only one case d-beta thalassaemia minor, sickle cell disease cases were 9 and sickle cell traits were seven in number

In severe anaemic category, 48.14% cases were of Nutritional anaemia ,22.2% were the thalassaemia cases and only two cases were of sickle cell disorder, while two cases were having both sickle cell disorder and thalassaemia. (Table:3).

Relationship between severity of anaemia and gender was found to be statistically significant ( $\chi^2 = 7.72, p>0.1$ ) (Table:4)

About 29 cases presented themselves with the clinical findings of pallor and splenomegaly. Out of which 58.6% (17/29) were severely anaemic and only one case presenting with same clinical findings was mildly anaemic. Only two cases were of hepatomegaly and 10 of patients presented with pallor and hepatosplenomegaly. About 60% of patients were of nutritional anaemia that developed hepatosplenomegaly as a complication.

**Table: 1 Gender wise distribution of anaemia**

Gender	No:ofcases	Mean Hb (gm/dl)±SD
Female	26	5.8±1.39
Male	28	2.34±1.06
Total	54	4.87±1.35

Figure 1

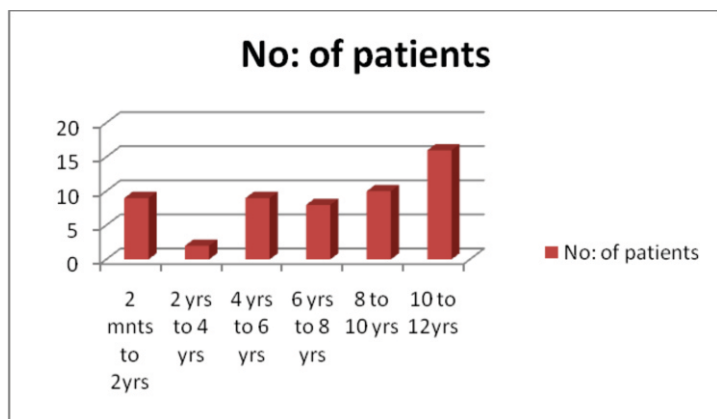


Table: 2 Religion wise distribution of anaemia

Hindu	50
Muslim	4
Total	54

Figure 2

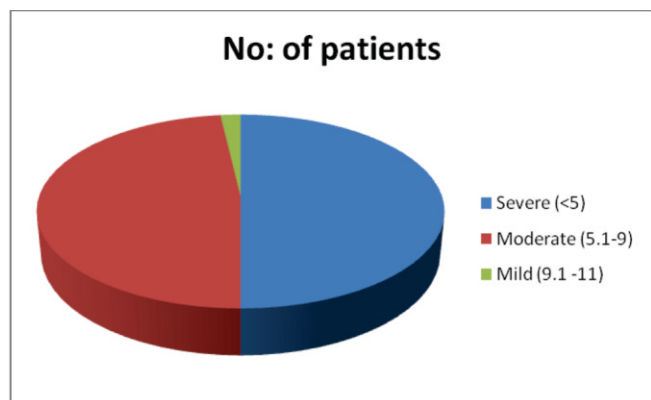


Table: 3 Diseases falling in severe anaemia

Disease	Numbers
Sickle cell disorder	2
Thalasemia	6
Sickle cell & Thalasemia	2
Nutritional	13
Leukemia	1
Malarial infection	2
Hookworm infestation	1

Table: 4 Relationship between severity of anaemia and gender

Grade of Anaemia	Female	Male	Total
Severe anaemia	8	19	27
Moderate and Mild anaemia	18	9	27
Total	26	28	54

$\chi^2 = 7.72, p > 0.1$  (found significant)

#### 4. Discussion

In our study we found the mean haemoglobin to be  $4.87 \pm 1.35$  gm/dl in children, amongst which mean haemoglobin level of  $5.8 \pm 1.39$  gm/dl was observed in females and  $2.34 \pm 1.06$  gm/dl was observed in males, respectively. Rationale reason for the cause of anaemia more in male as compared to females can be because of expression of anaemia due to sickle cell disorder or Thalassemia in males as compared to females.

48% anaemic patients were observed in the group of 8-12yrs which can be due to low socioeconomic condition, nutritional needs of the child increases rapidly which if not met leads to nutritional deficiency disorder one of which is anaemia. Children are susceptible to anaemia especially nutritional deficiency due to their increased needs for rapid growth (7).

Majority of the patients who are anaemic were Hindu as majority of Hindu population in Adilabad.

Maximum number of patients were of severe anaemia that was led by nutritional anaemia. The moderately anaemic category was also led by nutritional anaemia.

Policy and protocol development to control Nutritional anaemia in this area:

- The key advice for the families with the children should be:
  - Encourage the intake of meat, fish and green leafy vegetables.
  - Reduce tea intake during meals
  - Increase orange juice during meals
- Research Institutions, non governmental organizations and the media have important role to play.
- An important public strategy would be to promote an early detection and diagnosis of anaemia in the first year of life, aiming at early treatment and preventive measures.

4. Nutritional education to motivate appropriate feeding habits and adequate introduction of complementary food. Early diagnosis and treatment of anaemia and implementation of routine prophylactic supplementations with iron, including dose standardization and adherence monitoring.

5. My result contributes to a growing view that school based health programme are an effective way of promoting school attendance in less developed countries.

6. Consideration must be given to population based interventions for the prevention and management of IDA.

#### Sickle Cell disorder:

Prevalence of Sickle cell disorder in overall population is very high amongst tribal population. The same tribal population group residing in the neighbouring states of Gujrat, MP, AP have:

- Prevalence of Sickle cell disorder is very high amongst tribal population.
- The overall prevalence among tribal population is about 10% for the carrier state and 0.5% for sufferer (5).

Although the tribal health problem is grave, the health department is unable to provide them with any healthcare for several reasons. Teachers and medical students who have sufficient knowledge about subject are most unwilling to work in tribal areas. Since there is no specific treatment available for the disease the only alternative is prevention. Therefore, we can undertake such preventive measures like health education and genetic counseling. Taking into consideration on the problem of sickle cell disorder. ICMR launched a preventive programme on a tribal basis among high risk tribal populations. Activities are:

- Provide diagnostic facilities
- Health education
- Genetic counseling
- Marriage counseling

#### Thalassemia

Thalassemia are more common where consanguinity is common (8). A National Programme for thalassemia has not yet been formulated in India. The important step in this programme is identification and counseling of carriers and combination of different approaches is required for its establishment. India has one of the largest private health care sectors in world. Using Public – Private partnership, a good network must be developed for optimum care of children with beta- Thalassemia major and for education and screening for identification of carriers in a cost effective way where cascade screening will have significant role not only in big cities but also in small cities and rural areas in India.

All of the currently available interventions against anaemia fail to fulfill one or more of the following criteria that help to determine whether a health care strategy is successfully introduced at country level.

First, there must be convincing data relating to efficacy and safety. A balance must be struck between the need for further research and the timely development of clear policy recommendation. The translation of research into policy should be modified in relation to relevant new research (9).

Second, an intervention must be cost effective and affordable. "Affordability" is a function of political and financial commitment on the part of national governments and donor agencies.

Preventive strategies against anaemia are fundamental when we consider the potential threat to long term reversible or irreversible complications of anaemia.

Attempt to document past and emerging evidence for screening, diagnosis and treatment of anaemia in children aged 2-12yrs living in rural and remote communities of Adilabad and make recommendations for that remote area protocol development, further investigation and research.

#### 5. Reference

- [1] World Health Organization. Iron deficiency anaemia. Assessment, Prevention, and Control. A guide for programme managers. Geneva: WHO/UNICEF/UN; 2001.
- [2] Worldwide Prevalence of Anaemia 1993–2005. Geneva, Switzerland: World Health Organization; 2008. Available at : [whqlibdoc.who.int/publications/2008/9789241596657\\_eng.pdf](http://whqlibdoc.who.int/publications/2008/9789241596657_eng.pdf)
- [3] Stolfus R.J. Iron – deficiency anemia; Reexamining the nature at magnitude of public health problem. Summary: Implications for research & programs. J Nutr. 2001; 131:697-701.
- [4] Grantham –McGregor; S. and C.Ani, 2001. A review of studies on the effect of iron deficiency on cognitive development in children J Nutr. 2001; 131(suppl): 649S-666S.
- [5] Sachdev H, Gera T, Nestel P. Effect of iron supplementation on mental and motor development in children: systematic review of randomised controlled trials. Public Health Nutr. 2005; 8(2): 117–132.
- [6] Lozoff et al., Long –lasting neural and behavioral effects of iron deficiency in infancy. Nutr.Rev., 2006; 64: S34-43.
- [7] Alaattin Unsal et al., Prevalence of anaemia and related risk factors among 4 to 11 months age infants in Eskisehir, Turkey. J. Med. Sci., 7(8): 1335-1339.
- [8] Saxena A, Phadke S.R. Feasibility of thalassemia control by extended family screening in Indian context, J Health Popul Nutr; 2002; 20: 31-5.
- [9] Davis P, Howders- Chapman P, 1996. Translating research findings into health policy. Soc. Sc. J Med, 43: 865-872.