Original Research Article

Hematological patterns of anemic patients reporting to government teritiary care centre in Mandya, South Karnataka

Shoba K L[1], Yogender P[1,*]

[1]Dept. of Pathology, Mandya Institute of Medical Sciences, Karnataka, India

A R T I C L E   I N F O

A B S T R A C T

Introduction: Anemia is a common concern in different age groups. Anemia leads to loss in physical function, affecting quality of life and has substantial social and economic effects. Because anemia is a sign, not a diagnosis, an evaluation is almost always warranted to identify the underlying cause.

Objectives: As anemia is most commonly seen in children in whom it leads to growth retardation, women of reproductive age group where it can lead to maternal and child mortality and in the elderly in whom there is greater risk of co-morbidities, impaired functional status and greater risk of death, the objective of this study is to assess the patterns of anemia in this age groups.

Materials and Methods: A retro spective study was undertaken at Mandya Institute of Medical Sciences, Mandya, Teritiary care centre for a period of 6 months from May 2018 to December 2018. Children (1-15 years), women o f reproductive age group (16 - 60 years), Males (20-60 yrs) and elderly (both males and females) (>60 years) were studied. Routine hematological investigations were done by Hematological analyzer and peripheral smear examination was done to determine the pattern and etiology of anemia.

Results: Of the total 1000 hemograms that were studied, Females were 519 (51.9%) and Males were 280 (28 %), children were 201(20.1%) with Female prep onderance. Males and Females also include Elder patients. Most common age group in females was 16-60 years, in males was 20-6 0 years and in children age group was from 1 month to 15 years. Commonest pattern of anemia was observed Microcytic Hypochromic followed by Dimorphic, Macrocytic anemia and normocytic normochromic respectively.

Conclusion: Identifying anemia is an important aspect of assessment. It is essential for the further clinical evaluation. Confirming the type of anemia is important to direct the investigation for profiling the etiology since it is well known that the treatment of anemia has long way in improving the overall outcome and quality of life.

1. Introduction

Anemia is defined as Haemoglobin level in the blood is below the lower extreme of the normal range for the age and sex of the individual.[1]

The prevalence of anemia is 55.3% among women of reproductive age (non pregnant, non lactating women) and 24% of men, 69.5% in children .

In India, anaemia is the second most common cause of maternal deaths, accounting for 20% of total maternal deaths. Anaemia affects mainly the women in child bearing age group, young children and adolescent girls.

Association of anaemia with adverse maternal outcome such as puerperal sepsis, ante-partum haemorrhage, post-partum haemorrhage and maternal mortality is no longer a debatable subject.

Apart from the risk to the mother, it is also responsible for increased incidence of premature births, low birth weight babies and high perinatal mortality.[2]

Iron, folic acid, and vitamin B12 deficiency is expected among adolescents with poor nutrition. Their deficiency is of concern in India, as undernutrition was observed among about 60.0% of female and 45.0% male adolescents. Also, surveys have also observed significant prevalence of iron

* *Corresponding author.*
E-mail address: yogi5300@gmail.com (Yogender P).

deficiency anemia among adolescents. [3,4]

Anemia is a common condition in the older population, and the prevalence of anemia rises with advancing age. Although it was previously believed that declines in hemoglobin levels might be a normal consequence of aging, evidence has accumulated that anemia does reflect poor health and increased vulnerability to adverse outcomes in older persons. Even in persons 85 years and older, those meeting the World Health Organization (WHO) definition of anemia were found to have higher subsequent mortality rates than persons who were not anemic. [5]

Weakness, malaise and easy fatigability are complaints. Decreased oxygen content of circulating blood leads to dyspnea. Hypoxia leads fatty change in liver, myocardium and kidney. [6]

Anemia is also a common in elderly persons and can have more complications than anemia in younger adults. All the types of anemia are known to occur in this age group. Failure to evaluate anemia in elderly could lead to delayed diagnosis of treatable conditions. [7]

2. Objectives

To calculate the prevalence of anemia in children, women of reproductive age group and elderly patients in and around Mandya District.

To study the pattern of anemia in these patients.

3. Materials and Methods

All the patients for whom investigations were sent to the central lab in Mandya Medical College and Hospital from May 2018 to December 2018 over a period of 6 months.

Their blood samples were drawn and results were obtained through Hematology analyzer and slides for peripheral smear study were prepared by Leishman staining.

These slides were viewed under microscope and observations were noted down.

Inclusion criteria 1.Children in age group (1-15 years, male and female children) 2.Women of reproductive age group(16-40yrs) and Males (20-60 years) 3.Elderly (> 60 years both male and female) 4.Hb < 13gm/dl in males, Hb <11gm/dl in children 1-12 years and pregnant females, Hb < 12gm/dl in children 12-15 years and non pregnant women)

3.1. Exclusion criteria

1. Patients with a history of recent transfusion.
2. Patients who have undergone major surgical procedure in the past 3 months
3. Patients who were on haematinics.

4. Results

Out of 1000 cases taken for studying the distribution of subjects it has been noted that women of all groups were the highest (51.9%) followed by Males (28%) which was followed by children (20.1%).

Table 1: Distribution of study subjects out of 1 000 cases for prevalence of anemia

Gender	Number of subjects	Percentage
Children	201	20.1
Women Reproductive age group, Pregnant and Elderly females	519	51.9
Males including elder patients	280	28
Total	1000	100

Out of 201 children taken for studying the prevalence 57.21% of them were female children and 42.79% were male children.

Table 2: Distribution of study subjects according to sex in children for prevalence

	Gender	Number of subjects	Percentage
	Male children	86	42.79
Children	Female children	115	57.21
	Total	201	100

Based upon the peripheral smear study the most common pattern of anemia in children was found to of microcytic hypochromic anemia (74.63%) followed by normocytic normochromic anemia (13.93%), normocytic hypochromic anemia (4.98%) and Dimorphic(6.46%).

Table 3: Pattern of anemia in children on the basis of peripheral smear.

Pattern of anemia	Total number of subjects	Percentage
Microcytic hypochromic	150	74.63
Normocytic normochromic	28	13.93
Normocytic hypochromic	10	4.98
Dimorphic	13	6.46
Total	201	100

Out of 519 cases taken for studying the pattern of anemia in women of reproductive age group 350 were non pregnant,130 of them were pregnant women and 39 were Elderly females

Microcytic hypochromic anemia was the most common pattern of anemia based upon the peripheral smear followed by Dimorphic and Normocytic Normochromic anemia in pregnant women.

Table 4: Distribution of number of subjects based upon pregnant, non pregnant women and Elderly females in study subjects.

	Number of subjects	Percentage
Non pregnant	350	67.44
pregnant	130	25.05
Elderly	39	7.51
Total	519	100

Table 5: Pattern of anemia in women in pregnancy on the basis of peripheral smear.

Pattern of anemia	Total number of subjects	Percentage
Microcytic hypochromic	110	84.62
Dimorphic	10	7.69
Normocytic Normochromic	10	7.69
Total	130	100

It has been noted that Microcytic hypochromic anemia was the most common type of anemia in women of reproductive age group followed by Normocytic normochromic anemia, Dimorphic anemia and Macrocytic anemia.

Table 6: Pattern of anemia in women of reproductive age on the basis of peripheral smear.

Pattern of anemia	Number of subjects	Percentage
Microcytic hypochromic	280	80
Normocytic normochromic	40	11.43
Macrocytic	20	5.71
Dimorphic	10	2.86
Total	350	100

It has been noted that Microcytic hypochromic anemia was the most common type of anemia in women of Elderly age group followed by Normocytic normochromic anemia, Dimorphic anemia.

Table 7: Pattern of anemia in women of elder age on the basis of peripheral smear.

Pattern of anemia	Number of subjects	Percentage
Microcytic hypochromic	28	71.79
Normocytic normochromic	6	15.38
Dimorphic	5	12.83
Total	39	100

It has been noted that Microcytic hypochromic anemia was the most common type of anemia followed by Normocytic normochromic anemia, Dimorphic anemia in males.

Table 8: Distribution of number of males including elderly males.

	Number of subjects	Percentage
Males (15-60)	215	76.79
Elderly(>60)	65	23.21
Total	280	100

Table 9: Pattern of anemia in males(15-60) on the basis of peripheral smear

Pattern of anemia	Number of subjects	Percentage
Microcytic hypochromic	110	51.16
Normocytic normochromic	80	37.21
Dimorphic	25	11.63
Total	215	100

It has been noted that Microcytic hypochromic anemia was the most common type of anemia followed by Normocytic normochromic anemia, Dimorphic anemia in males.

Table 10: Pattern of anemia in Elderly males(>60) on the basis of peripheral smear

Pattern of anemia	Number of subjects	Percentage
Microcytic hypochromic	40	61.54
Normocytic normochromic	15	23.08
Dimorphic	10	15.38
Total	65	100

Most common cases of anemia in all age groups were Iron deficiency, Vitamin B_{12} deficiency, Helminthic infections, Vitamin B_{12} + Iron deficiency, Anemia of chronic disorders.
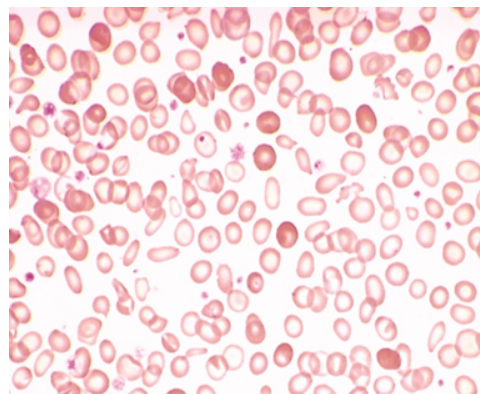
Fig. 1: Microcytic hypochromic blood picture (Leishman's stain)
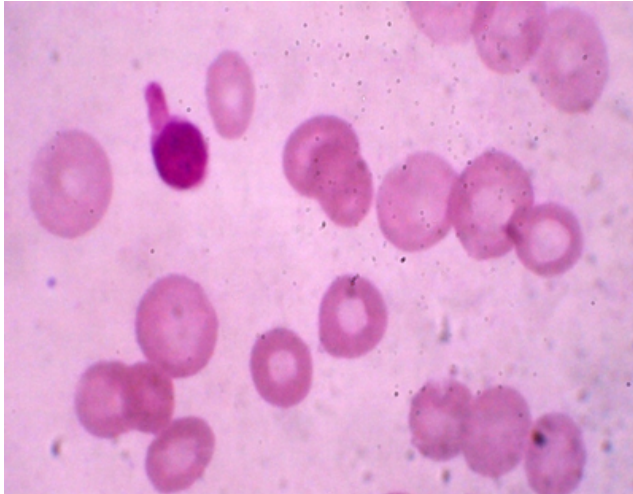
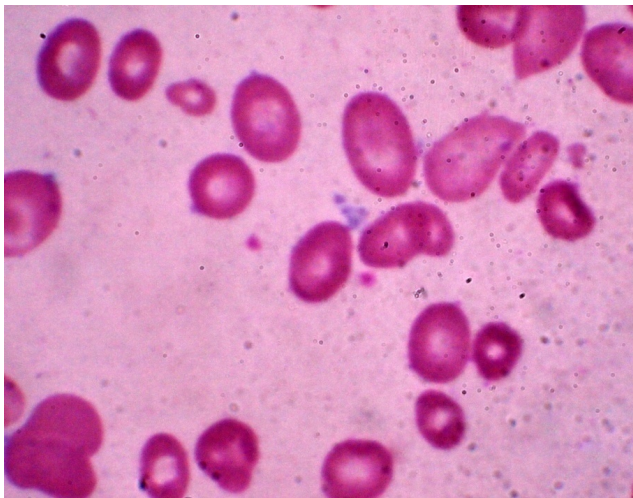**Fig. 2:** Macrocytic blood picture (Leishman's stain)

Fig. 3: Dimorphic blood picture (Leishman's stain)

5. Discussion

Neeraj Jain and Vibha Mangal Jain done study in 2010 regarding prevalence of anemia in school children aged 5-16 years from government school of Rishikesh, Uttaranchal, India and found anemia in 51.5% of cases. Most common blood pic ture was microcytic hypochromic. In our study in children microcytic hypochromic anemia was found to be predominant type accounting for 74.63% with iron deficiency anemia being noted in 80% of cases.[8]

In the present study, in children both males and females microcytic hypochromic anemia (74.63%)was common followed by, normocytic normochromic anemia (13.93%), normocytic hypochromic anemia (4.98%) and dimorphic anemia (6.46%) which is somewhat similar to study done by Kapur et al , where microcytic hypochromic anemia was the commonest type (43.2%) followed by normocytic normochromic anemia (27%), normocytic hypochromic

anemia (17%), macrocytic anemia (10%) and dimorphic anemia (2.7%).[9]

According to WHO in India 88% of pregnant and 74% of non pregnant women are affected . In our study it has been noted that anemia in pregnant women accounts for 25.04% and non pregnant women accounts for 67.44% which corroborates with WHO findings as study subjects were less.[10]

In our study in elderly, microcytic hypochromic anemia was the most prevalent anemia accounting for 71% of all the cases closely followed by normocytic normochromic anemia accounting for 25%. Elis et al. have shown that most common anemia in elderly is microcytic hypochromic anemia.[11]

6. Conclusion

Identifying anemia is an important aspect and absolutely essential for the further clinical detection. Confirming the type of anemia is critical to direct the investigation for profiling the etiology.

Iron deficiency anemia is a serious problem worldwide and a major concern in developing countries. In our study we found to have higher prevalence of iron deficiency in all the study subjects. The main reason behind this nutritional anemia could be due to low socio economic status, increased demands, low dietary intake and excessive loss of blood.

Proper diagnosis of anemic cases prevent morbidity and mortality further in life and patients get adequate treatment.

7. Source of funding

None.

8. Conflict of interest

None.

References

1. Firkin F, Chesterman C, Penington D, Rush B. 5th ed. . and others, editor. Blackwell Science Ltd ; 2008,.
2. Gautam VP, Bansal Y, Taneja DK, Saha R. Prevalence of Anemia Amongst Pregnant Women and its Socio- Demographic Associates in a Rural Area Of Delhi. *Indian J Community Med*. 2002;27(4):157–160.
3. International Institute for Population Sciences (IIPS) and Macro International, National Family Health Survey (NFHS-3).2005-06.vol. . *IIPS*. 2007;I.
4. Toteja GS, Singh P, Dhillon BS. Prevalence of anemia among pregnant women and adolescent girls in 16 districts of India. *Food and Nutr Bull*. 2006;27(4):311–315.
5. Izaks GJ, Westendorp RGJ, Knook DL. The definition of anemia in older persons. *JAMA*. 1999;281:1714–1717.
6. Lee GR, Foerster J, Lukens J, Paraskevas F, Geer J, et al. Wintrobes Clinical Haematology. Williams & wilkins ; 2003,. .
7. Iron deficiency anaemia: assessment, prevention, and control. A guide for programme managers. Geneva, World Health Organization ; 2001,. .
8. Neeraj J, Vibha MJ. Prevalence of anemia in school children. *Med Pract Rev*. 2012;3:1–4.

9. Kapur D, Aggarwal KN. Iron status of children aged 9-36 months in an urban slum ICDS Project in Delhi. *Indian Ped*. 2002;39:136–144.
10. World Health Organization. The World Health Report 2002: Reducing risks, promoting healthy life. *Geneva*. 2002;.
11. Elis A, Ravid M, Manor Y, Bental T, Lishner M. A clinical approach to idiopathic normocytic-normochromic anemia. *J Am Geriatr Soc*. 1996;44:832–834.

Author biography

Shoba K L Assistant Professor

Yogender P Assistant Professor