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Original Research Article

Prospective Observational Study to Evaluate the Clinical and Laboratory Profile of Anaemia Patients at a Tertiary Care Hospital

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Abstract

Aim: Aim of this study is to determine the clinical and laboratory profile of anaemia among patients admitted to our hospital.

Background: Anaemia is a major public health problem worldwide especially in developing countries like India. Nutritional cause of anaemia continues to predominate as the most common cause of anaemia.

Methods: Our study was a prospective study in which thirty-nine patients of anemia admitted to Medicine ward in NMCH hospital, Patna were studied for their clinical and laboratory characteristics. Duration of the study was 8 months.

Results: Anaemia was more common among females (70% of total patients). Patients aged 20-30 years contributed to 85% of patients. Pallor was the universal finding present in 100% of patients. On examination generalized weakness was the commonest (46.5%) presenting complaint followed by per vaginal bleeding (13.2%). Microcytic (48%) and dimorphic (28%) anaemia constitute the bulk of anaemia.

Conclusions: Nutritional anaemia particularly iron deficiency anaemia is the most common cause of anaemia. It tends to affect the working age group and females predominantly. Patients continue to present with severe anaemia to the hospital.

Keywords: Anaemia, Clinical Profile, Laboratory Profile.

Introduction:

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. [1] Anaemia is an indicator of poor nutrition and poor health. According to World Health Organisation (WHO) defines the lower limit of normal for Hb concentration to be 13 g/dl and 12 g/dl in men and women respectively at sea level. According to WHO, iron deficiency is thought to be the most common cause of anaemia globally, although other conditions, such as folate, vitamin B12 and vitamin A deficiencies, chronic inflammation, parasitic infections, and inherited disorders can all cause anemia. [2] Anaemia is usually underdiagnosed in elderly patients as the symptoms like easy fatigability, generalised weakness or

shortness of breath may be attributed to the normal aging process.

A survey conducted in United States on geriatric patients with anaemia showed that 11% in men and 10.2% in women had anaemia and the prevalence of anaemia was significantly increased with increasing age. In about two-third of elderly patients with anaemia causes were found to be nutritional anaemia and anaemia of chronic disease, and rest were unexplained. [3] India is among the countries with highest prevalence of Anaemia in the world. It is estimated that about 20%-40% of maternal deaths in India are due to Anaemia; India contributes to about 50% of global maternal deaths due to Anaemia. [4]

An Indian study on elderly individuals with anaemia showed an increased prevalence of anaemia ranging from 37 to 71%. [5-7] Many other studies on elderly patients with anaemia had determined that nutritional anaemia and anaemia of chronic disease were the most common causes. Other rare causes include thalassemia minor, hereditary spherocytosis, autoimmune haemolytic anaemia, hypothyroidism and myelodysplastic syndrome. The consequences of anaemia including increased maternal mortality, prematurity and decreased work productivity in adults are well documented

The aim of the present study was to evaluate the clinical and laboratory profile of anaemia patients at a tertiary care hospital in NMCH Patna.

Material & Methodology

This was a prospective observational study conducted in the Department of General Medicine, Nalanda medical college and hospital, Patna, Bihar, India. after taking the approval of the protocol review committee and institutional ethics committee. 171patients with anaemia were included in the study.

Inclusion criteria

- Patients more than or equal to 16 years of age of both sexes.
- Patients with anaemia as per WHO definition.

Exclusion criteria

- Patients not willing to give informed consent.

In all the above patient's thorough history was taken, general physical examination and systemic examination were done. Patients were subjected to routine blood investigations including complete blood count, peripheral smear study and serology for viral markers. Required radiological investigations were done and further studies like bone marrow examination, iron profile, vitamin B12 and folate levels were done in selected patients who did not respond to therapy started based on peripheral smear report. Stool for occult blood was done among elderly patient presenting with iron deficiency anaemia.

Statistical analysis

The collected were entered in SPSS version 22 and analyzed. Chi-square test was used to see association between important determinant of anemia with the help of p value based on 95% confidence interval and 5% standard error.

Results

Total 171 cases out of which 51(30%) were males and 120(70%) were females were enrolled in this study. In our study it was found that anaemia had its highest occurrence in the age group of 20-30 years 97(57%) followed by below 20- 30-year age group 36(21%). It was least among individuals aged above 50 years 3(2%)

Table 1: Demographic profile of the patients

Gender	Frequency	Percentage
Male	51	30%
Female	120	70%
Age		
Below 20 years	36	21%
20-30years	97	57%
30-40years	21	12%
40-50years	14	8%
Above 50 years	3	2%

Among the patients enrolled, generalized weakness was the commonest (80, 46.5%) presenting complaint followed by per vaginal bleeding, upper gastrointestinal bleeding. While other complaints included shortness of breath, body swelling, paleness, per rectal bleeding, myalgia, malar rashes and other modality of bleeding like acute traumatic blood loss and hemoptysis in descending order. (Table 2)

Table2. Presenting complaints

Presenting complaints	Frequency	Percent
Weakness	80	46.5
PV Bleeding	23	13.2
UGI bleeding	20	12.0
SOB	14	8.2
Body Swelling	10	5.6
Paleness	5	3.2
Myalgia	3	2.0
Malar rashes	3	2.0
Other causes of Blood Loss	13	7.3
Total	171	100

Moderately severe anemia was the commonest (80, 46.5%) laboratory finding among anemic patients followed severe, mild and life threatening in the descending order. Severity of Anemia according to WHO anaemia categories (haemoglobin cut-offs in g/dl).

Table 3

Anemia Severity	Frequency	Percent
Mild Anemia (above 10g/dL)	32	19.3
Moderate Anemia (8-10 g/dL)	80	46.5
Severe Anemia(6.5-8 g/dL)	39	22.5
Life threatening (less than 6.5g/dL)	20	11.7
Total	171	100

In the peripheral blood film study, microcytic hypochromic type was the commonest finding followed by MHA with Anisopoikilocytosis and Polychromasia. Normocytic normochromic picture was the second commonest finding which included anemia of chronic disease. Table 4

Table 4: PBF finding

PBF	Frequency	Percentage
MHA with Low Mentzer index	5	2.9
MHA	84	49.4
MHA with PC and AP	17	10.2
MHA with AP	12	7.0
Sickle cells	1	0.6
Normocytic Normochromic	28	16.4
Macrocytic Anemia	8	4.7
Pancytopenia	8	4.4
Blast Cells	4	2.6
Fragments of RBCS	1	0.6
Spherocytes	2	0.9
TG TV	1	0.3
Total	171	100

MHA-Microcytic hypochromic anemia

TG-Toxic granulation

PC- Polychromasia T

V-Toxic vacuolation

AP-Anisopoikilocytosis

Microcytic hypochromic anaemia 48(48%) attributed to iron deficiency unless proved otherwise was the most common form of anaemia in our study. Dimorphic anaemia 28(28%) was the second most common suggesting that nutritional anaemia continues to predominate in our part of world (Table 5).

Table 5: Peripheral smear study in patients with anaemia

Peripheral smear	Frequency	Percentage
Microcytic hypochromic anaemia	82	48%
Macrocytic anaemia	3	2%
Dimorphic anaemia	48	28%
Normocytic normochromic anaemia	38	22%

Discussion

In our study it was found that anaemia had its highest occurrence in the age group of 20-30 years 97(57%) followed by below 20 year age group 36(21%). It was least among individuals aged above 50 years 3(2%). predominantly affecting the working class of the population. Similar observations were made in a study conducted by Azad KL et al. [8] Statistically 70% of patients were females and rest were males depicting a female preponderance. Such female dominance was also shown in studies conducted by Alvarez-Uria G et al, and Talwelkar SR et al. [9,10]

Nonspecific symptoms like weakness, fatigue, are one of the commonest modes of presentation of anemia which can also be seen in conditions other than anemia causing diagnostic difficulties to the clinicians. In our study, generalized weakness was the most common complaint with a frequency 80 46.5%. Iron deficiency was the leading cause of anemia (87, 52.3%). Whereas, a study done by Chernetsky et al., revealed chronic diseases (65%) as a leading cause of anemia, followed by idiopathic etiologies (15.9%), chronic liver disease (13.2%), and nutritional deficiency (iron, vitamin B12, folate) (4%). [11] Similarly, another study done by Joosten et al., also showed the commonest etiologic factors

for anemia in elderly population to be chronic disease anemia (34%), followed by idiopathic anemia (17%), iron deficiency anemia (15%), post hemorrhagic anemia (7.3%), vitamin B12 and folate deficiency anemia (5.6%), chronic leukemia or lymphoma (5.1%) and myelodysplastic syndrome and acute leukemia (5.6%). [12] Low dietary intake of iron and loss due to parasitic infections are the main cause of iron deficiency anemia. Several pro- and anti-inflammatory cytokines and hormones produce the suppression of erythropoiesis in chronic disease. Alterations in the metabolism of iron via the molecule hepcidin and ferritin are largely responsible for the consequent anaemia. [13] The peripheral blood smear may be considered as an important and simple diagnostic tool, even in the era of genetic and molecular diagnostic techniques.

In our study, 82,48% of patients had microcytic hypochromic anemia favoring iron deficiency anemia as the aetiology of anemia which was confirmed with iron profile test and other possible causes of microcytic hypochromic anemia were also ruled out. A study done by Kumar A et al concluded that manual parameters like microcytosis, macrocytosis and hypochromia expressed as a percentage, have shown significant correlation, with their corresponding automated parameters. [14,15]

Conclusion

Nutritional anaemia and amongst them iron deficiency anaemia continues to be the most common cause of anaemia. Female gender is the most commonly affected gender. In spite of extensive steps taken by WHO and Government bodies in educating and treating people about the disease and the consequences of not getting treated, severe anaemia with or without failure continues as the most common mode of presentation of anaemia in medicine department of the hospital.

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