

Clinical profile of patients presenting with anemia in a tertiary care hospital: Observational study

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Abstract

Background: Anemia itself is not a disease but a clinical manifestation of some other underlying disease and results in tissue hypoxia and a wide range of clinical consequences. Internal medicine practice is accounted for by significant number of patients with anemia. The objective of our study was to determine the etiology and evaluate the different components of clinical profile of the patients presenting with anemia in department of internal medicine at civil hospital, Ahmedabad. **Methods:** Patients admitted with hemoglobin less than 10g/dl in the medical wards were enrolled in the study. Estimation of hemoglobin and other investigations were done to diagnose the etiology of anemia. Data were obtained by history taking, examination findings and investigation report. **Results:** Among 276 patients, 118 were male and 158 were female. The commonest age group was 40-49 years. Mean hemoglobin was 7.8 ± 1.1 gm%, the lowest being 2.8 gm%. Peripheral blood smear predominantly showed hypochromic picture in 193 patients, macrocytic picture in 25 patients and normocytic normochromic picture in 58 patients. Nutritional deficiency accounted for predominant cause of anemia (35.5%) followed by combined chronic liver disease, chronic kidney disease and anemia of chronic diseases together (28.2%). Majority patients were managed by nutritional and conservative therapy (iron, vitamin b12 and folic acid supplementation). Total 84 patients were transfused blood. Out of total 276 patients, in-hospital mortality was 21 (7.6%) especially in patients with variceal bleed and chronic kidney disease. **Conclusions:** Anemia is associated with a variety of diseases. In developing countries, nutritional deficiency especially iron deficiency and less commonly, vitamin B12 and folic acid deficiency are still the leading causes of anemia. Most of these patients are amenable to nutritional therapy. Mortality in patients with anemia is mostly accounted for by associated co-morbid conditions e.g. chronic liver and kidney diseases.

Key Word: Anemia, hemoglobin, iron deficiency.

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INTRODUCTION

Anemia means lack of blood and is defined as reduction of total hemoglobin below normal limits (13.6–17.2 gm/dl for

Males and 12.0–15.0 gm/dl for females).^{1,2} Anemia is an important clinical condition in medicine practice as it is highly prevalent, leads to significant morbidity, and is eminently treatable in majority.³ Anemia reduces the oxygen carrying capacity of the blood leading to tissue hypoxia. Anemia is responsible for about 20%-40% maternal deaths in India.⁴ Two major approaches of classifying anemia include the “kinetic” approach which involves evaluating production and destruction of RBC using reticulocytes as an important parameter and the “morphologic” approach which groups anemia by red blood cell size into microcytic if the cells are smaller than normal (under 80 fl), normocytic if they are of normal size (80-100 fl) and macrocytic if they are larger than normal (over 100 fl).^{5,6} Iron deficiency anemia is the most

common type of anemia overall and it has many causes. It is caused by insufficient dietary intake, especially in children and women in the developing countries or poor absorption of iron to replace losses from menstruation or losses due to diseases.^{5,7} Worldwide, the most common cause of iron deficiency anemia is parasitic infestation usually hookworm. Other causes are inadequate diet, unsatisfactory method of preparation of food and faulty social habits.² Normocytic anaemia occurs when the hemoglobin level is decreased, but the red blood cell size remains normal as in acute blood loss, anemia of chronic disease, aplastic anemia and hemolytic anemia. Megaloblastic anemia is due to a deficiency of either vitamin B12 or folic acid or both.^{6,8,9} We performed this study to find the clinical profile of patients presenting with anemia in a tertiary care hospital in Gujarat in terms of signs and symptoms, their etiology; to find out proportion distribution of type of anemia on peripheral blood picture, and to find out the pattern of nail changes in different types of morphological anemia

METHODS AND MATERIALS

We performed this prospective observational study at department of internal medicine, civil hospital, Ahmedabad, Gujarat. Study was approved by ethics committee of our hospital and informed and written consent was obtained from all the patients. Total patients included in the study numbered 276. All the patients age >14 years, who had hemoglobin <10g/dl were enrolled in the study from 1st January to 30th December 2017. Exclusion criteria were acute hemorrhage due to trauma, gastrointestinal or genitourinary bleed, patients on blood transfusion and iron supplement and anticoagulants therapy, the pregnant and lactating ladies, known history of cardiovascular disorders, thyroid dysfunctions and malignancies, patients on chronic corticosteroids, patients with history recent major surgical interventions. Patients were evaluated by detailed history and thorough physical examination. Investigation performed was individualized. Certain investigations were performed in all the patients while other were done selectively. Investigations performed in all patients were complete blood count including estimation of reticulocyte count and peripheral blood smear. Investigations done in selected cases were osmotic fragility test, hemoglobin electrophoresis, Coomb's test, Vitamin B12 and folate assays, Serum iron and total iron binding capacity (TIBC), serum ferritin, flow cytometry, stool examination, upper GI endoscopy including biopsy for helicobacter pylori, colonoscopy, bone marrow aspiration and biopsy, ultrasound of abdomen and pelvis, chest x-ray, serum albumin and total protein, liver function tests, renal function tests, thyroid function testing, Serum IgA tissue transglutaminase antibodies for celiac disease.

Statistical analysis: The data was collected and analyzed in SPSS 20. All descriptive statistics were used such as mean. Proportion as the variables were on ratio scales. Inferences were drawn using Z test of significance.

RESULTS

Total 276 patients were included in the study. Among them, 118(42.8%) were male and 158 (57.2%) were female. Mean age of the patients was 45±10.7 years and age range was 16-76 years (Table-1). The commonest age group was 41-50 years, followed by 51-60 years respectively. Mean hemoglobin was 7.8±1.1g/dl with hemoglobin range was 2.8g/dl to 9.9g/dl. Hemoglobin was less than 5g/dl in 63(22.8%) patients, between 5-8g/dl in 138(50%) patients and >8g/dl in 75(27.1%) patients. The most frequent symptom was easy fatigability which was present in 235 (85.1%) patients followed by dyspnea in 205 (74.3%) patients, palpitation in 188 (68.1%) patients, and swelling of limbs in 87(31.5%) patients. Other symptoms are shown in table 2. The rare presentation were bleeding per rectum in 19(6.9%) patients, and hematuria in 12(4.3%) patients. The clinical signs in descending order of frequency were Pallor in 276(100%) patients, Pedal edema in 67(24.3%) patients, and signs of Heart failure in 58(21%) patients. (Table 2) Peripheral blood smear in all the patients revealed microcytic hypochromic picture (108(39.1%) patients) as most common type of anemia followed by dimorphic (85(30.8%) patients), normocytic normochromic (58(21%) patients), and Macrocytic (25(9%) patients) as least common type. The proportion of Platyntychia was highly significant than Koilonychias in all types of anemia.

Table 1: The Demographical, Clinical and Etiological Profile of Population.

| Variables | N = 276 |
|---------------------------|-------------|
| Age (years) | 45 ± 10.7 |
| 14-20 | 8 (2.9%) |
| 21-30 | 22 (8%) |
| 31-40 | 56 (20.3%) |
| 41-50 | 104 (37.7%) |
| 51-60 | 71 (25.7%) |
| >60 | 15 (5.4%) |
| Gender | |
| Male | 118 (42.8%) |
| Female | 158 (57.2%) |
| Body Mass Index | |
| Mean (kg/m ²) | 22.62±1.42 |
| <18 | 53 (19.2%) |
| 18-25 | 183 (66.3%) |
| >25 | 40 (14.5%) |
| Hemoglobin (g/dl) | |
| <5 | 63 (22.8%) |
| 5-8 | 138 (50%) |
| 8-10 | 75 (27.1%) |

One hundred and ninety three patients had hypochromic morphology on peripheral smear. Iron deficiency was the

main culprit for hypochromic morphology. Among which, nutritional iron deficiency was present in 98 patients, variceal bleeding leading to anemia was seen in 25 patients, anemia of chronic diseases seen in 23 patients, NSAID induced GI bleeding in 18 patients, hookworm infestation in 14 patients and peptic ulcer in 12 cases. Among 25 cases having macrocytic picture in peripheral blood smear, 13 patients had megaloblastic changes in bone marrow examination. Out of them, 8 had vitamin B12 and 5 had folate deficiency. Remaining 12 patients who had macrocytic picture had associated chronic liver disease and hypothyroidism. Among the 58 patients having normocytic normochromic blood picture, 8 had hemolytic anemia, 9 had aplastic anemia and remaining were having anemia of chronic disease mainly chronic kidney disease.

Table 2: Sign and Symptoms wise distribution

| Symptoms | |
|-----------------------------|-------------|
| Fatigue | 235 (85.1%) |
| Dyspnea | 205 (74.3%) |
| Palpitation | 188 (68.1%) |
| Swelling of legs | 87 (31.5%) |
| Chest pain | 35 (12.7%) |
| Tingling | 48 (17.4%) |
| Gastrointestinal discomfort | 27 (9.8%) |
| Weight loss | 58 (21%) |
| Chronic diarrhea | 37 (13.4%) |
| Bleeding per rectum | 19 (6.9%) |
| Hematuria | 12 (4.3%) |
| Signs | |
| Pallor | 276 (100%) |
| Pedal edema | 67 (24.3%) |
| Heart failure | 58 (21%) |
| Mortality | 21 (7.6%) |
| Peripheral smear | |
| Microcytic | 108 (39.1%) |
| Dimorphic | 85 (30.8%) |
| Normocytic | 58 (21%) |
| Macrocytic | 25 (9%) |

Regarding blood transfusion, 84 patients were transfused blood. These group included cases of acute anemia mainly due to GI bleeding and other cases of severe anemia. Vitamin B 12 and folate was given to confirmed cases of megaloblastic anemias. Most of the patients received iron therapy as well. Out of total 237 patients included in the study, in-hospital mortality was 21 (7.6%). Out of 21 deaths, 8 deaths were due to variceal bleed, 7 deaths were due to chronic renal failure, 3 deaths due to severe thrombocytopenia in patients with hematological malignancy and 2 deaths in patients with sickle cell anemia with crisis and 1 deaths in patients with peptic ulcer bleed. The expired patients were mainly cases of variceal bleeding and chronic kidney disease.

Table 3: Etiology wise distribution

| Etiology | |
|------------------------------|---------------|
| Identified | 249 (90.2%) |
| Not identified | 27 (9.8%) |
| Serum iron (mcg/dL) | 37.97±7.87 |
| TIBC (mcg/dL) | 616.76 ±12.72 |
| Ferritin (ng/mL) | 10.76 ±1.42 |
| Etiology | |
| Nutritional | 98 (35.5%) |
| Chronic kidney disease | 27 (9.8%) |
| Chronic liver disease | 25 (9.1%) |
| Anemia of chronic disease | 23 (8.3%) |
| Hemoglobinopathies | 23 (8.3%) |
| Auto-immune hemolytic anemia | 20 (7.2%) |
| Connective tissue disorder | 19 (6.9%) |
| Hematological malignancies | 15 (5.4%) |
| Celiac disease | 12 (4.3%) |
| Miscellaneous | 14 (5.1%) |

DISCUSSION

Ours was hospital-based study on demographic, clinical and etiological profile of patients presenting with anemia. Our study included 276 patients out of which 118 patients (42.8%) were male and 190 patients (68.8%) were >40 years age. In our study majority of patients were middle aged or elderly, the findings are consistent with the study by Yun GW *et al.*¹⁰ Our results are also in accordance with the studies done by Lamsal⁵, Qureshi¹¹, Parekh¹² where maximum number of patients seen were above 40 years of age. The most frequent presenting symptom was easy fatigability followed by dyspnea and palpitation. Presentation of patients in our study was in agreement with studies by Prakash¹³, Bhasin¹⁴, and Shoaib Khan¹⁵. In our study, 12.7% patients had symptoms of chest pain masquerading organic heart disease. Studies have reported anginal pain in about 30% of patients with anemia⁵ and usually occur when the Hb% is below 5g/dl (Aliza Zeidmanetal¹⁶). We also observed angina pain in our study in patients with hemoglobin below 4.5g/dl. The clinical signs at presentation in our study in descending order of frequency were Pallor, Pedaledema, and signs of Heart failure in order of frequency. Similar results were observed in a study by Lamsal KS⁵, Bhasin¹⁴, shoaib khan¹⁵. Most common morphology in peripheral smear in our study was microcytic hypochromic anemia (39.1% patients) followed by dimorphic anemia (30.8% patients), normocytic normochromic (21% patients) and least common was macrocytic anemia (9% patients). Similar results were observed by Prakash *et al.*¹³, Bhasin¹⁴, Lamsal⁵. Koilonychia in our study was observed in 23.3% patients and platynychia in 36.3% patients. Koilonychia was seen in both microcytic and dimorphic anemia the incidence in dimorphic anemia was 30%. The clinical profile, nail changes and peripheral blood picture showed

similar results with many studies on anemia thus this study stands true with existing clinical profile studies of anemia in Indian subcontinent.^{1,5,11-14} In developing countries, still nutritional deficiency and liver and kidney disease account for majority of cases rather than malignancies or connective tissue disorder. In our population, nutritional deficiency accounted for 35.5% cases while chronic liver disease, chronic kidney disease and anemia of chronic diseases together accounted for other 28.2% cases. Majority of these patients respond to nutritional therapy with good clinical outcome. Blood transfusion is reserved only for severe cases and patients with malignancy. In our study, only 84 (30.4%) patients required blood transfusion while mortality in our series was only 7.6% mainly in patients with chronic liver disease and hematological malignancies.

CONCLUSIONS

Anemia is associated with a variety of diseases. In majority of patients cause of anemia can be diagnosed by thorough investigations. In developing countries, nutritional deficiency especially iron deficiency and less commonly, vitamin B12 and folic acid deficiency are still the leading causes of anemia. Most of these patients are amenable to nutritional therapy, infrequently require transfusion and have low mortality. Blood transfusion usually required in patients with associated co-morbid condition. Mortality in patients with anemia is mostly accounted for by associated co-morbid conditions e.g. chronic liver and kidney diseases.

REFERENCES

1. Chandurkar M, Pendalya S. Clinical profile of patients presenting with anemia in a tertiary care rural hospital of western Maharashtra. *Int. J. Clin. Biomed. Res.* 2017;3(4S):74-77.
2. Isselbacher, Kurt J. *et al.* Harrison's Principles of Internal Medicine, 13th ed. New York: McGraw-Hill, 1995.

3. Stolfus RJ, Heidkamp R, Kenkel D, Habicht JP. Iron supplementation of young children: Learning from the new evidence. *Food Nutr. Bull.*2007;28(4 suppl): S572-S584.
4. WHO, WHO global database on anemia / Edited by Bruno de Benoist, Erin McLean, Ines Egli and Mary Cogswell, 2008 <http://whqlibdoc.who.int/publications/2008/9789241596657>.
5. Lamsal KS. Clinical profile of patients with anemia. *Journal of Institute of Medicine*:2009; 31(3): 32-33.
6. Beutler E, Lichtman MA, Coller BS. *Williams hematology*. 6th ed. New York: McGraw-Hill; 2000.
7. Recommendations to prevent and control iron deficiency in the United States. Centers for Disease Control and Prevention. *MMWR Recomm Rep.* 1998;47(RR-3):1-29.
8. Lee GR, Foerster J, Lukens J. *Wintrobe's clinical hematology*. 10th ed. Baltimore, Md: Lippincott, Williams and Wilkins; 1999.
9. Hoffman R, Benz EJ Jr, Shattil SJ. *Hematology: basic principles and practice*. New York: Churchill Livingstone; 1998.
10. Yun GW, Yang YJ, Song IC, Park KU, Baek SW, Yun HJ, *et al.* A prospective evaluation of adult men with iron-deficiency anemia in Korea. *Intern Med.* 2011;50(13):1371-5.
11. Nasrin A. Qureshi. Study of anemia and its correlation with Hematological parameters in patient of various age group. *Journal of Dental and Medical Sciences* 2015;14(9):29-35.
12. Parekh Alok. Study of anemia in Surat. *Western Int. J of Med Res.*2012;2(3):369-371.
13. Prakash KG. Clinical Profile of Anemia in Elderly: A Cross-sectional Study from a Tertiary Care Centre. *Sch. J. App. Med. Sci.*, 2015;3(3C):1266-1270.
14. Amit Bhasin. Characteristics of Anemia in Elderly: A Hospital Based Study in South India. *Indian J HematolBlo.* 2011;27(1):26-32.
15. Haji Muhammad Shoaib Khan. Symptoms based evaluation of iron deficiency anemia students of Bahawalpur correlated with their eating habits. *Tropical Journal of Pharmaceutical Research.* 2014;13(5):769-772.
16. Aliza Zeidman, *etal.* Anemia as a Risk Factor for Ischemic Heart Disease. *IMAJ.*2004;6:16-18

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